

THE WRITTEN SYNTAX OF A GROUP OF DEAF ENGLISH CHILDREN,  
WITH A DISCUSSION OF THE METHODOLOGICAL AND THEORETICAL  
PROBLEMS INVOLVED IN THE STUDY

THESIS SUBMITTED FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

BY

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ABSTRACT

Previous investigations of the language skills and performance of children suffering from severe or profound auditory disability have yielded conflicting results. Some research workers have asserted that the deaf have no language and may even lack the ability to acquire linguistic rules. Most workers have made quantitative comparisons between the language of deaf and hearing children and have shown a massive retardation in linguistic development in the former. However they also report numerous errors in the language of the deaf that make it appear often bizarre and usually deviant. No attempt is made to detect whether these errors are random or systematically structured. A rather small number of other workers have shown that the language of their deaf subjects is rule-based but their work is weakened by their reliance on spontaneously generated data and by the imposition of an English-based transformational grammar in the language samples being analysed.

The author has developed and previously used with 10-year-old deaf children a controlled elicitation technique of language sampling that avoids the pitfalls involved in using spontaneous data, viz. the problems of interpreting rarely-occurring or absent syntactic forms and of not knowing



unambiguously the reference of every utterance. This technique is applied here to a group of profoundly deaf 13-year-old children and it is shown that their language productions are based on systems of structured rules. The elicitation technique is shown to be valid and reliable and is sufficiently sensitive to allow the detection of rather subtle changes between successive developmental stages. The analysis gives insights into the syntactic rules underlying spontaneous language samples taken from the deaf subjects and enables a tentative description of some extended texts to be carried out. It is shown that many of the "errors" described by earlier workers appear not to be so when the texts cease to be approached from the position of normal English, but are viewed as forming part of a language system sui generis.

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I N T R O D U C T I O N



## INTRODUCTION

"A deaf child is a human being without language" (Furth, 1973, p.13)

Any professional worker with severely and profoundly deaf children will have met psychologists who, studying the complex relationship between thinking and language, seek to perform tests of one sort or another on their pupils. Largely as a result of the work of Furth (1966, 1973 and many other papers and books) and Oléron (1957) psychologists assume that children with severe hearing loss dating from birth or before the normal age for the appearance of speech and language will be alinguistic. Since tests of cognition tend to be contaminated by linguistic factors and can thus never be removed from the domain of language, it is felt that study of deaf children will provide an excellent population for research into "pure", non-linguistic thinking. Furth states this view clearly,

The fact is that .... the vast majority of persons born deaf do not acquire functional language competence (Furth, 1966, p. 13) .... (and) ... in short, one may thus come closer to the behavioural ideal of an objective study of thinking that is not beclouded by extraneous factors of language (ibid, p. 229, italics supplied).

This view, that deaf children fail to develop linguistic skills, is reinforced by Fusfield, an experienced

worker with young deaf adults in the U.S.A. After studying the scholastic achievements of the more able graduates of schools for the deaf in the U.S.A. seeking admission to Gallaudet College (a university for the deaf), Fusfeld concluded that:-

Words are there in profusion but they do not align themselves in the right places. (Fusfeld, 1955, p. 67).

More recently, a team of psychologists working at Vanderbilt University have formed much the same opinion:-

It is very rare that a deaf person learns to use English generatively. (Blanton et al., 1967, p. 100).

The same workers suggest that,

Rule learning is a rather weak tendency in the deaf. More of their effort is expounded in learning individual items rather than in the acquisition of rules by which further items may be learned. (op. cit., p. 6).

Such views are reinforced by research findings that show that very few British and North American children (and probably of most other countries, although the literature has not been studied) suffering from any significant degree of auditory impairment leave school able to read beyond a rather low level (Gaskill, 1957; Wrightstone et al., 1963) or to express themselves orally or in written form with any degree of fluency

or accuracy (Denmark, 1973).

In view of this evidence and the experience of many, perhaps the majority of, teachers of deaf children, any attempt to study the language of these children may appear to be rash. One is forced to ask: What is there to study?

Although it is probably true that most linguists (as opposed to psychologists and educationalists) accept that deaf children do utilise structured rule systems in their attempts to communicate linguistically, the question is by no means dead or without interest. The evidence from research with a linguistic orientation is not, as will be shown, entirely satisfactory for a number of reasons. Thus we cannot be sure that the profoundly deaf do have a true language system. Further we find, for example, a philosopher of education at London University, Richard Peters, arguing that Furth has, in his book "Thinking without Language", made a significant and lasting contribution to the philosophy of mind and suggesting that the book be required reading for all educators (personal communication). Similarly, Noam Chomsky has, in a recent publication speculated that "We do, I am sure, think without words - at least so introspection seems to show" (Chomsky, 1976, p. 57) and continuing:-

We will have only a partial understanding of syntax if we do not consider its role in the expression of thought (ibid. p. 59).

There is no evidence for the first assertion. The extensive work of the Wurzburg school of psychologists (Humphrey, 1963) suggests that, in the absence of words, thinking tends to reduce to rather imprecise feelings of "readiness". It is difficult to see how the assertion could be either supported or disproved since such an enterprise would demand an alinguistic experimental population, who would then not be able to communicate readily the results of any introspection involved in the experiment.

The second of Chomsky's assertions may be of great theoretical and practical significance and if the language we use does play a part in the way we think (Sapir, 1949; Whorf, 1956) then the kind of syntax that we have available may constrain our thinking in several interesting ways.

The investigation described in the following pages is an attempt to find answers to these problems:-

- (a) Do children born profoundly deaf, in reality form and use linguistic rules?
- (b) If they do, what are the nature of these rules?
- (c) Can it be shown in any fashion independent of the rules themselves that the sorts of rules the children may possess have any influence on their thinking?

In order to obtain the data necessary for this enterprise a rather new method of linguistic investigation has been developed. A subsidiary part of the investigation will consist of an attempt to assess the scientific status of this new methodology. The aims, therefore, of this research are multiple: they will involve questions of linguistic-research methodology, of descriptions of linguistic data and of the applications of these descriptions to the problems outlined above.

S E C T I O N   O N E

A Survey of Earlier Research

## CHAPTER I

### Statistically based studies of the language skills of deaf children

The pessimistic views of the writers quoted in the introduction are based on fundamental but unexamined assumption: that deficiency in use and understanding of standard English reflects a deficiency in language skills as a whole. Superficially this assumption may appear reasonable when working with deaf children in Britain and the United States of America, since these children seem to be trying to use English words and live and are being educated in English-speaking communities. No attempt has been made to examine the possibility that these children may be using English words, possibly with semantic denotations and connotations roughly similar to those of normal English speakers but set in a non-standard syntactic matrix.

In contrast a number of investigations have accepted, albeit implicitly, that deaf children are using some form of structured and meaningful language. But again, frequent use of the word "errors" in research reports and the statistical comparisons made with the language productions of other groups of children suggest that workers are using standard English as a tacit norm. As a result rather similar measures of language as other workers have used with hearing children - e.g. mean length of utterance (McCarthy,

1929; Nice, 1925), type-token ratios or counts of traditionally labelled word-classes, usually based on the model of Fries (1952), etc. - have been applied to corpora of spoken and written utterances produced by deaf children.

In part this practice derives from the tenacious and deep-seated belief of psychologists that only data taken from large samples are valid. Given the strict temporal and financial constraints on most research projects a large sample necessarily entails the use of easily applied, superficial forms of analysis. But the practice also has its origins in current mechanistic behaviourist models of language. This is well expressed by Flavell:-

Prior to the present decade, researchers (in the field of language development) had models of the output and of the process of language development, both models frequently implicit rather than explicit. The model of the output was, to oversimplify slightly, an adult who had at his disposal: (1) a large vocabulary of words he could pronounce, perceive and decode correctly, classifiable by an observer into the traditional gross syntactic categories of noun, verb, adjective, etc., (2) an ability, simply stipulated rather than analyzed, to concatenate these words into sentence strings the structure of which was also describable (although not often described) in traditional grammar-book ways. The model of the developmental process that yielded such an output was essentially an accretional, quantitative one, tacitly or expressly derived from contemporary learning theories. Thus language development was seen as a gradual but uniform process of getting the appropriate items into the repertoire: of approximating the adult phonology phoneme by phoneme; of acquiring vocabulary word by word; of producing sentences of one-word, then two-word, then three-word length, and so on. (Flavell and Wohlwill in Elkind and Flavell, 1969, p. 68).



The first major study of the language of deaf children in time and within this mechanistic framework was made by the Heiders (Heider and Heider, 1940), studying 1,118 accounts of a short motion picture written by deaf and hearing children of seven different age groups. The analysis illustrates all the points made by Flavell and each production was scored in terms of average length of composition as a whole, average length of sentences, comparative use of simple, complex and compound sentences and a more detailed study of the frequency of occurrence of verb phrases depending on a tabulation of main and subordinate verbs, infinitives, gerunds, participles and prepositional phrases.

The Heiders concluded:-

- 1) that there is a definite positive relation between length of sentence and age for both hearing and deaf students;
- 2) but that hearing children use longer sentences than the deaf, with the youngest hearing children (aged 8 years) producing slightly longer sentences than the oldest deaf children (17 years);
- 3) that, as compared with the hearing, deaf children use fewer compound sentences and "ten year old hearing children use as large a proportion of compound sentences as seventeen year old deaf children".  
(Heider and Heider, 1940, p. 56).

The Heiders recognise that scoring may be difficult since the determination of the boundaries of sentences may be difficult in the case of deviant utterances but they

attempt to overcome this heuristically by defining a sentence as containing a single subject. Where, as in Then he got sick his mother came out, there are two non-identical subjects the utterance was scored as two sentences. The authors do not make explicit where such a sentence would be divided, but presumably in this case a division would be inserted between sick and his:-

Then he got sick. His mother came out.

In contrast a similar sentence with co-referential subjects is seen as unitary:-

He got sick he put his hand to his head.

Such a solution is clearly unsatisfactory, but given the state of contemporary thinking in psychology and linguistics, influenced by models of language that conceived sentences as mainly mere concatenative sequences of word-units, it is doubtful whether any more valid analysis would be possible and the solution has the merit, at least, of recognising the problem. Indeed, the Heiders go beyond this and admit that their primitive enumerative methodology is inadequate for the task:-

It seems ..... likely that the differences between the deaf and hearing cannot be fully expressed in quantitative terms .... and they represent differences not merely of skill in the use of language forms, but in the whole thought structure. (op. cit., p. 99).

The Heiders summarise their conclusion:-

"The compositions of the deaf are made up of a relatively larger number of sentences which are shorter in number of words and in number of clauses than those of the hearing. They use relatively more simple sentences than the hearing, fewer compound and complex sentences." (ibid, p. 64).

Some attempt is made to describe the quality of the language of deaf children:-

"The whole picture indicates a simpler style, involving relatively rigid unrelated units which follow each other with little overlapping of structure and meaning ..... The deaf tend to interrupt the narrative and explain why more frequently than the hearing or .... they rarely speak of what is only a possibility rather than a concrete fact." (p. 99).

Unfortunately, the greater part of the research carried out in this area during the following thirty-five years has replicated the mechanical aspects of the Heiders' work while ignoring their perceptive and potentially valuable insights, that the deaf may be using non-normal systems of thinking and, possibly, of language.

Nice (op. cit.) had shown that, with normal children, successive developmental stages of sentence length correlated with the growth of general vocabulary. This view was developed further by McCarthy (op. cit.) and, although it has been criticised strongly and regularly almost since it was first adumbrated (Crystal et al., 1976; Shriner, 1969; Smith, 1935) it has persisted and imposed a powerful influence on much subsequent work. Whether comparison of levels of language development based on mechanical enumerations have

any validity is not the point at issue here. More important is the insidious assumption that the language of deaf children and hearing children are similar (or, more accurately, that the grammar of deaf children is a subset of the grammar of the hearing). If such an assumption is not made then there is little point in making any such methodologically primitive comparison at all.

A similar approach has been used in part by Wells (1942) who computed both total numbers of words used by groups of profoundly deaf, partially deaf and hearing children aged between nine and twelve years and average numbers of words per child in each group. His conclusions repeat those of the Heiders:-

As a whole the hard-of-hearing do not write as voluminously as the hearing pupils, especially at the same grade levels. (p. 16).

The (profoundly) deaf, as a group, write from 30% - 60% less than the hearing, with boys producing less than girls. Wells also studied the use of "abstract" words (i.e. "abstract nouns, prepositions and relative pronouns (p. 1)), on the reasonable assumption that:-

the actual extent to which words of an abstract or relational character are used is an indication of the child's understanding of such words (p. 3).

A completion test consisting of 65 statements involving use of relational words or "words to complete

meaning" - mainly relative pronouns or subordinating conjunctions was used on this investigation. "Relative" words were divided into seven different types: causals, comparisons, concessives, conditionals, resultatives, and temporals, with a "dustbin" or residual category of relationship words, that is "words which could not be placed in any of the other six categories" (p. 72) - for, that, what, where, which, who, whose.

The conclusions of this study are that normally hearing boys and girls "are clearly superior to the deaf at every grade level in the percentage of abstract nouns used" (p. 102). The differences are statistically insignificant except at Third Grade level. In use of relational words the deaf boys are significantly inferior to hearing boys while, although deaf girls score lower than hearing girls, the differences remain statistically insignificant until the Fifth Grade (age eleven years). Although there are some strange and unexplained interruptions in the process of acquiring the forms studied, development in the deaf children appears to continue for two or three years after it has stopped with the hearing. The conclusions reached by Wells reinforced those of the Heiders: he found in the deaf a gross retardation of development with some additional qualitative differences.

Thereafter, little serious research was done until Fries outlined a newer conceptual structure in his book,

"The Structure of English" (Fries, 1957). Within the next ten years four major investigations were published.

Simmons elicited five written and one spoken compositions based on six series of pictures from 54 deaf and 112 hearing children. Each composition was analysed "by determining the number, the length, the complexity of sentence, the number of words or tokens, the relative frequency of certain grammatical categories and the ratio of subordinate verbs to independent ones" (Simmons, 1962, p. 417).

Flexibility and rigidity of word usage were estimated by means of calculated type-token ratios (Johnson, 1944), where types are the number of different word-classes in a sample and tokens are the total number of words used.

Simmons concluded that "the deaf children wrote and spoke more simple sentences than did the hearing" (p. 417) and that an overall type-token ratio "indicates that vocabulary diversity can differentiate between the language of hearing children and that of deaf children" (p. 418). However, the productions of the hearing exhibit greater "stability" than the deaf. Simmons does not make clear exactly what is meant by this term, but<sup>it</sup>/is likely that he is referring to within-group differences, that is that the deaf children were less consistent among themselves than the hearing children.

The deaf children used more words of Fries' Classes I and II (nouns and verbs) and determiners, but fewer of Class IV (adverbs), auxiliaries and conjunctions. The groups were roughly equal in use of Class III words (adjectives) and prepositions.

In addition Simmons attempted to compare spoken and written language and discovered that there were noticeable differences among the deaf in the two skills: deaf children had a higher type-token ratio in speaking than in writing: they used words from a far wider range of grammatical categories in speaking and approached the level of hearing children at ages 12 and 15, possibly indicating more accurate use of normal English. Both the hearing and deaf use nouns more in speaking than writing, while the deaf use more determiners and the hearing more conjunctions in speaking.

This enumerative analysis was supplemented by an attempt to describe the quality of language used by the deaf children. Amongst the older children "every structure is 'straight' but quite rigid and stereotyped" (p. 418). Once again Simmons does not explain his use of the description, "straight". It is probable that it refers to a rather rigid syntactic correctness commonly noted by teachers and other workers with the deaf.

Hart and Rosenstein (1964) also made use of Fries'

categorial system to test the hypothesis that deaf children acquire lexical meanings more easily than structural meanings "and that it is the delayed mastery over morphology, syntax and function words that causes retardation in the use of sentence forms" (op. cit., p. 680). They studied two groups of children all of average I.Q. and profoundly deaf from birth or before the age of 2. The younger group were aged between  $9\frac{1}{2}$  and  $11\frac{1}{2}$  years, the older between  $12\frac{1}{2}$  and  $14\frac{1}{2}$ . The children had to complete sentences by selecting one word out of four, and to select synonyms and antonyms for underlined words embedded in sentences.

The investigators discovered significant differences between the age groups in favour of the older and between "fast" and "slow" groups in favour of the more intelligent. Their hypothesis was confirmed in that children achieved significantly higher scores in choosing lexical than structural words.

Somewhat later Elliott made a rather similar study of the language development of mainly partially hearing children (Elliott *et al.* 1965). Ratings were obtained, together with "certain objective scores" based on "weighted measures of total numbers of different words, total numbers of very-high-frequency words, total number of different function words and total duration of utterance" (abstract). Oral responses to pictures were elicited and analysed in this way. In addition a sentence-repetition procedure based on the work



of Brown and Fraser (1964) was included.

Various classes of words (in Fries' classification) were counted and type-token ratios computed. Ratings were made by trained teachers in global terms of "structured sophistication, grammatical accuracy, content and creativity" (op. cit., p. 7).

Elliott's paper demonstrates the futility of the mechanical word-count procedures referred to by Elkind and Flavell (op. cit.): readers are treated to an impressive display of statistical terminology but learn almost nothing about the language actually used by the children. One table includes four short samples of language produced by one child with only moderate auditory impairment, but nowhere else in the paper is the subject directly referred to. Instead are found correlations between the reliability of different raters, between "mean ratings on four scales for each picture stimulus, for three samples of children" and so on. It is doubtless important to know that judges achieve a measure of agreement among themselves, but in the process the actual subject - the language of the deaf - is neglected. It is safe to predict that no reader of the paper who had not experienced the language of deaf children would learn much of value about it from the paper.

Fries' model was used also by Goda (1964) in an attempt to study the spoken syntax of normal, deaf and

retarded adolescents. This work began very promisingly as the author recognised the real nature of what he was studying: "Syntax includes the way in which words and supra-segmental morphemes are arranged relative to each other in utterances" (op. cit., p. 401). However, he used a curious analytical procedure which destroyed much of any structure that might exist: the total number of words obtained in response to pictures were divided arbitrarily into "100 different-word groups" (p. 401). No explanation is given for this division: presumably it simplified somewhat the task of converting raw data into percentages. Thereafter the sets were analysed in terms of Fries' classification.

All three groups of subjects used a majority of Class I words. Class I and II words formed three-quarters of the total speech of the deaf. The deaf and retarded children used more Class II but fewer Class III and function words than normally hearing children. Differences were noticeable between the deaf and retarded children: the former used more Class II and III words and fewer function words. "Inferior language skills of the deaf are evident from the use of relatively few different words despite the fact that many more responses were collected from deaf subjects" (p. 403 ).

Similar conclusions, based on a similar research design, were reached by Brannon (1968) who also studied spoken utterances. In general, hard of hearing children

(i.e. those with only relatively slight auditory impairment) were not significantly different from normal children in use of most of Fries' word classes, but the more severely deaf were different with all classes except conjunctions. They also produced much less language. The hard of hearing were deficient in adverbs, pronouns and auxiliaries and the severely deaf were most deficient in them:-

For example, the average deaf child used adverbs only two times, usually the words there and very; used pronouns ten times (they and her commonest); and used auxiliaries 22 times (is and are commonest). The deaf child did not use definites at all (p. 284). Brannon concluded that "hearing impairment interferes with the learning of function words more than with the learning of content words" (p. 284) and agrees with the findings of Goda, "that the oral language of deaf children tends to be more telegraphic as seen in less use of auxiliaries and other expanding words, and tends to contain many fewer different words than normal" (p. 286).

Taken as a group this set of investigations yielded little new information. Of their four major conclusions, three:-

- i) the preference for simpler sentences (Simmons),
- ii) use of rigid and stereotyped style (Simmons),
- iii) overuse of content, as opposed to function words (Simmons, Goda, Brannon, Hart and Rosenstein),

had already been reported by the Heiders some twenty years earlier. Brannon's use of the term "telegraphic", suggesting implicitly the application of some regular and systemic deletion transformations to normal English syntax is the only new and potentially seminal outcome of this research.

Two later investigations made use of a different research design and the cloze technique (Salzinger et al., 1962). Here, continuous passages of prose are presented with words deleted at regular intervals under the assumption that as the deletion-interval decreases the passage approximates less and less closely to normal English. The task facing the subject is to recognise the message encoded in this fragmentary form and to insert a word that, if not verbatim or identical with the deleted word, will be appropriate semantically, or, at a lower level, will belong to the same grammatical class as the deletion. The lowest order, or complete failure, is choice of a word that is not only semantically anomalous, but also syntactically inappropriate.

Blanton and his co-workers (1967) utilised the cloze technique, varying both form-class deletions (Jones et al., 1963) and degree of contextual constraint (Fillenbaum et al., 1963), deleting words at every rate from every third to every fifth position. 156 deaf subjects from two schools and 171 hearing controls in two groups were tested. One control group was matched with the deaf for mean age, the other for mean reading achievement grade level.

Blanton found that "the control subjects' performance was much better than that of the deaf groups on every measure at every different rate" (p. 68). For the deaf "the number of correct verbatim restorations remained low

at all deletion rates, but the number of form-class restorations increased. In other words, apparently, greater contextual constraint aided the deaf in predicting the form-class of a deleted syntactic word but not the particular deleted word itself" (p. 69). The data given by Blanton (p. 70, fig. 11) show that the deaf scored very poorly: only in nouns did children from both schools for the deaf reach an accuracy rate of 50% with verbs slightly below. In one school, insertions of auxiliaries just reached 50%: all other form-class successes were considerably lower. It was rare for verbatim (i.e. semantically and syntactically<sup>al</sup> correct words) restorations to reach as high as 25%. In contrast, the hearing children scored much higher rates, only falling below 50% accuracy in one form-class (quantifiers) in one group. In addition, the hearing children produced fourteen out of the possible twenty verbatim sets of scores above 50%, in many cases well above.

The deaf children tended to replace articles, prepositions, conjunctions, pronouns and quantifiers by nouns, but "in general, their responses were scattered broadly over the remaining form-classes" (p. 69). These results suggest that the deaf subjects had little real idea either of the meaning or of the syntactic form of what they were reading. Cohen (1965) expressed much the same opinion, also using the cloze technique: "It may be concluded that the deaf group had not learned either to recognise or to produce the typical sequential dependencies of English" (p. 34). The

group studied by Cohen were "exceptionally verbal" and the author comments that her results "probably offer a rather high estimate of the predictability of the written language of deaf children, and probably overestimate the ability of deaf children to use the redundancy in the writings of others" (p. 35).

This tendency to use nouns inappropriately, both in semantic and syntactic terms, must force us to view with some scepticism the work of earlier investigators based on Fries' classification: it may be that for the deaf apparent "nouns" have not any clear nominal function as in normal English, but are merely rather crude labels for concepts ill-defined both in meaning and linguistic function. If this be so, and if, as is not unlikely, other apparent grammatical forms are equally imprecise, then no form of categorisation into conventional grammatical classes has any validity.

Moore, too, used the cloze technique in his study of the psycholinguistic functioning of deaf adolescents, deleting every fifth word in a continuous text (1970). He found that the deaf were significantly inferior to hearing controls, not only in production of verbatim responses but also in form-class responses. In this study the deaf children (of mean age 16 years 9 months) were considerably older than the hearing control group (mean age 9 years 10 months), although both scored roughly equally in tests of

reading attainment. Moores concluded that the scores achieved by deaf subjects in reading tests gave an inflated estimate of their reading ability. This point is of great importance not only theoretically but heuristically, since a number of investigators use equivalence of reading attainment as a matching variable between groups. Once again Moores repeats the discovery made by many of his predecessors: "In addition to poorly developed grammatical abilities, the deaf subjects also exhibited restrictive, repetitive modes of expression and limited vocabulary" (p. 651).

The cloze technique has been attractive to many researchers especially those with backgrounds in a statistically-based methodology and behaviourist psychology. Test instruments are easily and cheaply prepared; scores are readily computable and the apparent possibility of detecting the closeness of approximation to normal English is seductive, yet in fact the technique can provide only the most superficial information about linguistic competence. Investigators using the method show little real awareness of the cognitive and linguistic processes involved in performing this sort of task. At least two rather different sorts of skill are involved. One of these involves knowledge and processing of the gross conceptual and lexical units, the so-called "content" words. Incorrect guessing of a key noun or verb at the beginning of a sequence may seriously impair subsequent performance. Thus, among a

group of post-graduate students of language pathology at Guys Hospital who were given the task of completing a clozed newspaper account of the launching of a new daily-paper in which the word paper was omitted, several, believing that the article referred to the launching of a new ship, were unable to complete the passage. A second skill involves recognition of the many subtle distinctions, not only of time, aspect and mood, but also stylistic and many other contrasts, contributed by the "function" words. These frequently present redundant information that can not only be supplied from elements elsewhere in the passages, but that is also in some cases, highly predictable. Hence, omission may present fewer problems than is the case with content words. Thus retrieval of omitted functors depends to a great extent on syntactic knowledge, whereas retrieval of content words demands lexical and social knowledge of a very different order. Thus a mechanical deletion of every  $n^{th}$  word in a passage in order to secure a more or less close approximation to standard English achieves little more than an uncontrolled and usually unrecognised confusion among a complex of different psycholinguistic processes.

The research discussed here has shown the great degree of retardation in language understanding and use of the deaf. Ivimey (1977,b) has shown that there are also great retardations in the general and social knowledge of the majority of deaf school-leavers. Given this impoverished background of knowledge, the deaf, when they are



trying to complete clozed passages, are in reality trying to perform in a language that is not only imperfectly known but that is also set in a cultural framework whose essential characteristic features are often barely understood.

It has been shown (Ivimey, 1976<sup>(a)</sup>; Ivimey and Lachterman, in manuscript) and will be demonstrated at greater length in this dissertation that deaf children in early adolescence have developed a use and understanding of the major content-word categories (although with restrictions of lexical and conceptual knowledge within these categories, as compared with hearing children of the same ages) but have not yet learned to modify these through regular use of even rather crude distinctions by means of functors. The omissions of auxiliaries and the misuse of determiners and so on reported by every investigator appear to be systematic. As a result, the deaf produce what is virtually a naturally clozed language, in the sense that many elements are missing systematically from their productive language and appear to go unrecognised in receptive processes. Application of a controlled (or, as shown above, of a semi-controlled) cloze technique to a language system that is naturally clozed in ways over which the investigator has no control, and which he may not even recognise, reduces the value of the method and makes any conclusions based on it tentative in the extreme.

It has been argued that the cloze technique, like other mechanistically applied methodologies, is inadequate

for the purposes for which it has been used. However, each of these mechanical methods has the heuristic advantage that results are numerical and can be easily scored. As a result large numbers of subjects can be used in any investigation without the expenditure of much time. For these reasons the approaches have retained an appeal, especially for psychologists, and has been utilised over and over again, even as late as 1968 (Perry, 1968<sup>(a)</sup>,<sup>(b)</sup>,<sup>(c)</sup>).

Probably the most complete of these mechanically based investigations is that reported by Myklebust (1960), using a large body of spontaneously produced written material.

Myklebust carried out an analysis in terms of the total number of words used per subject, total number of sentences, average sentence length and ratio of words to sentence. Once again, more attention is paid to statistical than to truly linguistic matters. For each measure Myklebust computed means and standard deviations. This procedure is questionable even within a purely psychometric framework: means and standard deviations have meaning only when the data on which they are based is normally distributed and can be measured in some interval (and preferably) ratio scale. No evidence has ever been produced that mean length of utterance and similar measures are distributed in their frequency even in a quasi-normal manner. The apparent

interval scale achieved by counting words is probably misleading and is certainly statistically irrelevant, as will be shown later. From this work, however, we learn that:-

- 1) deaf and hearing children as groups show an increase in age in numbers of words used, while, at all ages from nine to seventeen years, the deaf use about half as many words as the hearing;
- 2) the deaf produce fewer sentences than the hearing, up to age fifteen, and in both groups, development ceases at about age thirteen;
- 3) both groups show a steady quasi-linear development in words per sentence ratios, again with the deaf reaching about half the level of the hearing.

In addition, Myklebust purports to analyse and describe "language structure and correctness". He recognises the nature of syntax: "the patterns of formation and structure of sentences" (p. 291) but makes no attempt to analyse or even describe these patterns. Instead, he produces an enumeration of various errors: omissions, substitutions, additions, word order and punctuation. He also draws attention to the frequent occurrence of "carrier phrases", i.e. series of sentences varying only in one element:

I see a boy

I see a dog

I see a baby

etc.

These errors, characteristic of the written language of deaf children, form deafisms. These features occur also

in the productive language of hearing children, but usually at much earlier ages. In all of them the deaf show skills inferior to those of hearing seven year olds, at nearly all age levels investigated. The differences are all statistically significant.

The most frequent deafism was omissions, found in more than 80% of deaf children from age nine to fifteen (producing the naturally closed utterances discussed above). A characteristic example is:-

A boy playing

The second most common error was substitution:-

e.g. A boy will playing

made by 50-60% of the deaf throughout the period of formal schooling. The third most frequent error is addition:-

e.g. A boy is be playing

which remains fairly constant at 25-30% up to the age of thirteen, increasing to nearly 50% at age fifteen. The fourth class or error, word order (A boy playing is) occurs less frequently but is used by 10-15% of children at all ages.

One major problem with this form of analysis is that

no initial criteria are given for allocating forms to specific classes of errors: it seems to depend very much on the guess of the investigator. Thus A boy will playing may be, as Myklebust claims, a substitution for A boy is playing. Equally, it could represent an omission from A boy will be playing, or it may represent an addition of will and -ing, linked with omission of final -s from A boy plays. What is clear only is that, as compared with normal English usage, the deaf appear to be syntactically very confused. To impose on this confusion a taxonomy based on implicit and self-defined criteria achieves very little. It will be shown later that forms typical of Myklebust's "deafisms" constitute a pseudo-morphology, representing a stage in the emergence of normal English morphology, using approximations to English forms with non-standard time and aspect reference.

A more serious criticism of Myklebust's work has been made implicitly in the immediately preceding paragraph. Nowhere is it demonstrated that these "deafisms" form a structured system as opposed to merely random occurrences. If the errors are random then this is strong evidence for the position adopted by Furth, Fusfeld and Blanton, described in the introduction: that the deaf as a group are essentially a-linguistic, i.e. that they are permutating largely meaningless symbols to achieve structureless or only loosely structured concatenations of words. If this be so then the bulk of the research described in this chapter is also

meaningless. Little of value is to be achieved by counting mainly random sequences or words and dividing them into conventional grammatical categories. No attempt at computing type-token ratios, mean-lengths of utterances or average numbers of words per sentence can be valid unless what is being counted and computed refers to the stable entity: a sentence. No random concatenation of words can rationally be treated as a sentence.

If, in contrast, the errors are not random, but form regularly patterned structures, then one may reasonably conclude that the deaf are utilising a language system, i.e. an ordered and systematic set of rules that influence the expression of internal cognitive complexes. Formal study of this language system becomes justified. The question that remains is whether an enumerative statistical analysis is fully capable of describing this system. This point will be considered more fully later.

As with most of the other research described in this chapter, Myklebust supplements his statistical analysis with some useful but rather limited descriptions of the language of deaf children. Their stories are shorter than those of hearing children. Within these stories their sentences are also relatively shorter and are characterised, as we have seen, by numerous "errors". Further "the deaf tend to write more about the actual circumstances portrayed in the picture, more about what can actually be observed" (p. 348). Thus the work of the deaf is more concrete,

when compared with that of the hearing, many of whom wrote stories based on hypothesis or imagination. Myklebust also provides examples typical of the language of deaf children at different ages.

The eleven substantial analyses of the language skills of deaf children discussed in this chapter have yielded rather few findings, although there is substantial agreement amongst the reports:-

- i) in general, the deaf produce shorter language samples than the hearing (Brannon, Heider & Heider, Myklebust);
- ii) these short samples tend to be formed from mainly simple, as opposed to complex and compound sentences (Heider & Heider, Myklebust, Simmons);
- iii) within these simple sentences there is a tendency to produce concrete, as opposed to abstract forms (Heider & Heider, Myklebust, Wells) and this is reflected in a relative over-use of content words (especially nouns and verbs) and under-utilisation of modifiers and function words (Brannon, Goda, Hart & Rosenster, Simmons, Wells);
- iv) syntactic forms may be different from those of normal English and deaf children demonstrate "a lack of knowledge of the sequential dependencies of English" (Blanton, Cohen, Moores);
- v) syntactic sequences, where they are not incorrect, tend to be rigid and relatively inflexible (Myklebust, Wells). This point is made also by van Uden (1978), who described this use of language as "baked".

A few writers recognise that the essential characteristic of language is systemicity, but there are no attempts at analysing in a formal and comprehensive manner the nature

and structure of systems involved. Indeed there seems to be some confusion as to the nature of systems in general and even where authors recognise the essential systemic nature of language, the methods of analysis that they use seem designed, if not to destroy, at least to minimise any structural features present. We have seen above how Goda, defining syntax as "the way in which words and suprasegmental morphemes are arranged relative to each other" (Goda, op. cit., p. 401), seems to recognise this point. Yet he then destroys any possibility of performing a systemic analysis by dividing passages into one-hundred-word groups and counting elements within these groups.

Von Bertalanffy, the formaliser of Systems Analysis has characterised a system as "a set of elements standing in interrelations" (Von Bertalanffy, 1968, p. 55). Writing more recently, Lockwood (1972) has gone further; the essential feature of a system is the system of "conceptual correlations" that it represents. In a system concepts occur not as random collocations but in structured hierarchies of reciprocally interacting groups. In the extreme the elements may become comparatively unimportant since it is the relations, seen as sets of potential privileges of occurrence, that determine to a great extent whether and under which circumstances individual concepts or clusters of concepts may reciprocally interact or are excluded from such interaction. These relationships may modify considerably the meanings of the individual elements that enter into them.



Thus boy may be represented loosely as a cluster of semantic specifications including <+ human>, <+ male> - adult , but few native speakers (other than lexicographers, teachers and linguists) ever use the word in this limited way unless performing a relatively trivial labelling activity or recall problem (e.g. repeating all English nouns beginning "b"). The word is most commonly used in context:-

The boy kicked the girl

The boy was killed by a car

Give this money to the boy

Each of these examples gives the word boy an added element < + agent> <+ subject> ; <+ subject> <+ patient> <- living> (now) ; <+ recipient>, etc. As used by a colonial official it may acquire the added feature of <+ adult> and where coloured servants form a slave class it may acquire the feature <- human> so that under certain circumstances a coloured "boy" may be treated inhumanely. In the expression "tom-boy", the element <+ male> may be lost. Since the apparently more fundamental features of humanity, masculinity and juvenility appear to be deletable according to context it is impossible to regard the syntactic, that is relationally derived, features as any less important in meaning, than a basic dictionary definition.

Any form of research that focuses on enumerations of

members of grammatical categories (and a fortiori that regards them as equivalent and interchangeable units, e.g. in M.L.U. designs) ignores this important relational aspect of meaning and focuses on only the more primitive approach to analysis of systems (von Bertalanffy, op. cit.).

The fact that it has persisted in research probably derives from two sources. On the one hand it may be that the authors are ignorant of the importance of structural systems in language. This is difficult to accept since many of the works discussed in this chapter date from after publication of Chomsky's "Syntactic Structures" in 1957 and even where they antedate it they ignore the influential structuralist models of language that were extant as early as the 1930's. Much of von Bertalanffy's work dates from the 1940's and has had a great influence on the physical and biological sciences as well as in such fields as management and the study of organisational behaviour. The persistent seduction of an enumerative-statistical method must derive to a great extent from the assumptions of the mechanistic, behaviourist school of psychology in which the majority of psychologists and educationists have been trained, and in which language is seen as learned sequences of stimulus-response bonds (Staats, 1944 ) that increase in length with time spent in learning. Since, in this model, structure has very little (if any) place, an enumeration of these stimuli - response units may be held to yield an adequate measure of linguistic skill and development.

On the other hand, such a methodology betrays two assumptions that are implicit rather than consciously formulated and that are potentially dangerous. One assumption is that the elements being counted and compared, e.g. in the language of deaf and hearing children, are so similar to each other in meaning and possibilities of syntactic usage as to justify the use of identical descriptive categories. Lockwood has made a useful contribution here in his explication of the term "conceptual correlations":-

Concepts surely involve the correlation of many factors in our immediate and past experience. The concept "dog" for a speaker of English, for example, may involve visual impressions, auditory impressions as to the characteristic noises made by dogs, olfactory impressions as to the smell of a dog, tactile impressions as to the feel of a dog's nose and coat, and other, often idiosyncratic impressions based on individual experience (op. cit., p. 2).

Some of these idiosyncratic impressions will have been derived from direct experience, but many will be obtained through second-hand verbal experiences (e.g. as to the feel of a living snake's skin) and many more remotely through figurative use of language: footsteps can be dogged and behaviour (with a change of rhythm) may also be dogged; the dogs of war may be unleashed and a man may be called a dog because of inferior social status, or a hound through indulging in gross behaviour. It is probably safe to say that a great, possibly the greater, part of our conceptual correlations has been constructed out of verbally transmitted cues, rather than from direct experience.

If such be the case then the deaf, excluded from much casual verbal experience by their handicap, from most literary experiences by their lack of linguistic fluency and ignorant of much that is common within their culture through the restrictions of their schooling (Getz, 1956), will develop many restricted and non-standard conceptual correlations. That this is, in fact, the case can be seen in a study made by the writer (unpublished).

In this study twelve hearing boys and girls, aged 11 years, were asked to mark a cross with a piece of chalk on the door of their classroom. All performed this simple task with ease. Ten severely deaf boys and girls of average intelligence and the same age were instructed to carry out the same task. The teacher held out a piece of chalk, said "Draw a cross on the door" and pointed to the command written on the blackboard. As with the hearing children, each child was tested separately. Nine of the deaf children could not perform the task and indicated through words and gesture that it was impossible. One boy climbed on a chair and marked a cross on the upper edge of the door. Clearly the word on has different meanings for these groups of children. For the hearing it means "on the surface of", while for the deaf it indicates "on the upper surface of" an object.

The same children were asked to throw a ball of paper in the waste-bin. Now, for a hearing child in a school context this use of "throw" does not mean the same as throwing a stone or other missile. Indeed, many teachers would

interpret as a form of insolence any violent projection of the paper ball. In fact none of the hearing children threw the paper ball: each one dropped it from above and with varying degrees of gentleness into the bin. All of the deaf children stood some distance from the waste paper basket and clearly threw the ball into it. For each group the meaning of throw appears to be different. These examples highlight the dangers inherent in the assumption that words of similar sound or appearance have identical denotative and connotative meaning for different groups. If they do not, then comparisons based on the counter-assumption that they do can have little value.

The second assumption is that the relationships existing between the elements that are being counted and compared are, by and large, so similar in the two systems as to warrant no further investigation. It may be that this assumption is justified but frequent references in the literature to "errors" and "deafisms" as well as to rather different stylistic usage suggest that, once-again, the assumption may be illfounded.

A final, heuristic, problem in analysing language utterances in terms of enumerative measures is to be found in determining the exact boundaries of sentences. This difficulty was recognised by the Heiders who specified the criteria they intended to use, but other authors have been

less sophisticated, assuming for the most part that the concepts word and sentence were self-evident. Unfinished or truncated utterances and concatenations of loosely linked words appear to occur with some frequency in the language of the deaf. In many cases it is impossible to detect clear boundaries between sentences. Few authors deal seriously with this problem. Most, apparently, place such sentences in an error category which is then removed from the corpus of data before analysis. It is rare to find reports of what proportion of the total corpus these jettisoned data forms. Other writers make no mention of these deviant utterances and it is impossible to decide whether conclusions are based on all the data or only part of it, how large this part is and what criteria have been used to exclude the remainder.

We see, therefore, that this group of investigations which were designed so that precise, standardised statistical procedures of analysis and comparison could be applied, have succeeded in achieving little more than some rather low-level descriptions of uncertain validity. Cooper and Rosenstein (1969) express this point of view clearly: much of the research prior to 1966 describes "aspects of performance which are essentially irrelevant to linguistic competence". (op. cit. p. 69).

## CHAPTER II

### Analysis of systems in the language of deaf children

In opposition to the superficial element-enumeration and descriptive studies described in Chapter I, Flavell describes those based in the "new wave in psycholinguists" incorporating the revolutionary deep-structure and transformational models of languages developed by Chomsky and other theoretical linguists. This model is conceived in terms of processes and output:-

The model of the output is a complex device that includes as part of its equipment a finite set of rules by which it can, in principle - - -, generate all and only the infinite number of grammatical sentences in its native language. This system of rules that characterises the adult's abstract knowledge of the structure of his language is referred to as his linguistic 'competence' and is identical to a formal grammar of that language". (Flavell & Washburn, p. 69).

The new focus on sets of rules involves investigators directly in a study of the systemic aspects of language. Different workers, argues Flavell, will investigate many different aspects of this systemicity. What they will not do

manifestly, is describe grammatical development in terms of such variables - irrelevant for the new output model - as sentence length (ibid., p. 70).

We have seen already that Cooper and Rosenstein have cate-

gorised most work in the field before 1966 as essentially irrelevant to contemporary orientations in theoretical linguistics. Henceforth, the aim of linguists will be to identify and describe the complete or (more usually) partial sets of ordered rules and transformations that appear to account for the performance data obtained from the subjects being studied. Chomsky expressed the central problem thus:-

The problem for the linguist - - - is to determine from the data of performance the underlying system of rules that has been mastered by the speaker-hearer. (Chomsky, 1965, p. 4).

During the past decade a small number of workers have investigated the language systems of deaf children from this newer orientation. In some cases this has involved an attempt to write a more or less comprehensive grammar or statement of rules (Ivimey, 1976<sup>(a)</sup>; Ivimey and Lachterman, in manuscript; Lachterman, 1974; O'Neill, 1973; Russell et al., 1976; Taylor, 1969) while others have made more particular analyses: of passivization (Power & Quigley, 1973; Tervoort, 1970), pronominalisation (Wilbur et al., 1975), complement structures (Quigley et al., 1975), usage of non-performative verbs (Ivimey, in manuscript) and so on. There are some important differences of approach between the majority of these workers and Ivimey and Lachterman's work in London. This latter will be fully discussed in the following chapter.



### Gross Syntactic Rules

The most comprehensive and earliest of these investigations was carried out during the late 1960's in the U.S.A. by Taylor (1969). Her report adopts a standard T.G. notation of re-write rules and transformations. The majority of her subjects used a standard sentence-generating rule:-

$$S \longrightarrow NP + VP$$

but this appears to be preceded developmentally by verbless structures:-

<u>Rule</u>	<u>Example</u>
1. $S \longrightarrow NP + \text{locative}$	<u>The bird away</u>
2. $S \longrightarrow NP + \text{adj.}$	<u>The ant happy</u>
3. $S \longrightarrow NP + NP$	<u>The ant idea</u>

Quigley and his colleagues (Quigley et al., 1975 ) report a closely parallel structure in the frequent absence or confusion of auxiliaries in progressive and perfective verb-phrases. It may be that these verbless sentences are developmentally primitive but Ivimey (unpub. manuscript) noted that in the data obtained from his 10-11 year old profoundly deaf subjects, similar sentences occurred alongside more normal ones (i.e. incorporating performative verbs.

The significance of these two sorts of sentence will be discussed later.

Other distinctive problems noted by Taylor are errors in prepositional usage, seen in sentences like:-

The ant walked to home

He thanked to the dove

and misuse of determiners which were often omitted at all ages up to 16 years. Where determiners were used there was considerable confusion between definites and indefinites. O'Neill (1973) supports this: his subjects accepted determiners redundantly (e.g. in some the truck) and inappropriately with mass nouns.

### Conjoined Structures

Taylor also examined the structures in conjoined and compound sentences. She reports that conjoining is the most frequently attempted transformation in the written language of the children she studied, aged 10½-16½ years. And is the most frequent conjunction, but it is often used incorrectly. For example, it may be omitted:-

A ant see a tree a bird

A ant walk found animals,

misplaced:

The dove got out of the tree and took a  
leaf threw it down,

or over-applied:

The ant ran to its home and get the scissors  
and bit a man's leg.

Wilbur (Wilbur et al., 1975 ) supports Taylor. At 18 years of age the deaf subjects whom he studied still made mistakes in handling the conjoining transformations<sup>x</sup>. At age 10, deaf children accepted as correct in 56% of cases sentences like:

The dog barked the cat ran away.

This conjoining by juxtaposition declined with age but at age 18 20% of subjects still judged it to be acceptable.

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x These writers do not make explicit whether their subjects actually used transformations or whether transformations were part of the investigators' theoretical armamentarium. Inspection of their work suggests that they accept an orthodox view of transformations: that they represent in some real way psychological structures (Chomsky, 1965)

Wilbur notes that and appears to be the easiest conjunction for the deaf but, in contrast, but and or presented greater difficulty. With these forms there was, in many cases, little or no improvement with age.

In Wilbur's sample the youngest children made no use of deletion transformations when producing conjoined sentences, merely linking the two stimulus sentences with and. Thus:

The girl chased the dog and

The boy chased the dog

were written as:

The girl chased the dog and the boy chased the dog.

This primitive form gives way later to a more standard form:

The girl and the boy chased the dog.

The apparent earlier misuse (of simply linking two initially separate sentences with and) can be found in the spontaneous language of younger hearing children. It may mark an early developmental stage but it may also reflect an artefact of Wilbur's sampling method. In his investigation, subjects were presented with parts of sentences and instructed to produce a single sentence with the same meaning. It is

possible that Wilbur's youngest subjects did not fully understand the task, for, in contrast, Ivimey's 10 year olds (Ivimey and Lachterman, op. cit.) spontaneously produced sentences like:-

Mary and John watched the television

in response to a picture showing a boy and a girl sitting in front of a television set. Before giving names to the children, many of Ivimey's subjects spontaneously produced:-

Boy and girl watched the television

Relative Sentences

Taylor and Quigley<sup>eval.</sup> (op. cit.<sup>a</sup>) also examined the ways in which their subjects handled relativization. Quigley studied the decisions made by his subjects about the acceptability of various standard English and deviant relativised sentences. He concluded that deaf children had a poorer understanding of all forms of relativized clauses than hearing children of much younger ages. In another study Quigley, Smith and Wilbur (1974) discovered that, in a comprehension test of relativized sentences, hearing children aged 10-12 years scored more highly (with 83% correct responses) than deaf children, aged 18-19 (76% correct). They discovered too that different types of relatives presented different degrees of difficulty in

understanding for the deaf.

Sentences with the relative clause in final position were easiest to understand:-

I saw the boy who(m) you helped and

I saw the boy who kicked the girl

but, the children found medial relative clauses more difficult:-

The girl who hit the boy went home

The girl who(m) you saw went home

The authors suggest that this order of difficulty arises from the operation of a simple S-V-O model of language. Where this can be applied, understanding occurs. Where it cannot, mistakes are made: in the second pair the deaf understand the boy and you as subjects of the second verb went home.

A more recent study (Davis & Blasdel, 1975) of the perceptual strategies employed in the interpretation of relativized sentences by hearing-impaired and normally hearing children has extended these conclusions. In this investigation the hearing-impaired children suffered from only relatively slight auditory disacuity, with average measured hearing losses for pure tones of 50-70 dB over the

speech range (250-4,000 Hz.) in the better ear. The stimulus sentences were spoken rather than written, as is more customary with profoundly deaf children. Although patterns of response in the two groups were broadly similar the deaf were less accurate than the hearing. The former seemed to operate on a developmentally more primitive model, interpreting the first (pre-verbal) noun in a sequence as subject/agent and the second (post-verbal) noun as object/recipient.

The relative clause is either arbitrarily ignored .... or is perceived as being a description of the subject and not representative of the sentence as a whole. (op. cit., p. 288).

The method used by Davis involved the selection of one picture (out of four) that was judged more appropriate to each relativized sentence. It would seem that, even where no knowledge is possessed of English relativization rules, knowledge of the major lexical constituents should enable a reader to recover the correct information and select the appropriate picture. Thus in the sentence:-

The frog that splashed the water ate the bugs

a subject who operated on the sequence:-

frog - splashed - water - ate - bugs  
(N<sub>1</sub>)      (V<sub>1</sub>)      (N<sub>2</sub>)      (V<sub>2</sub>)      (N<sub>3</sub>)

should select the picture frog-ate-bugs, (i.e. N<sub>1</sub> - V<sub>2</sub> - N<sub>3</sub>)

rather than water - ate - bugs ( $N_2 - V_2 - N_3$ ), since it is frogs, not water, that devours insects. However,

the fact that the hearing impaired children gave  $N_2 - V_2 - N_3$  (i.e. water - ate - bugs, G.P.1.) responses on all but three of the stimulus sentences, none of which contained either obvious ambiguities or logical  $N_2 - V_2$  relations, indicates that they are subject to more sources of confusion in relative comprehension than are normal-hearing children (ibid. p. 291).

The authors suggest that this confusion may arise out of difficulties with vocabulary, basic word relationships (i.e. the interpretation of semantic implications of syntactic ordering) or "misperception of the words spoken".

These explanations are probably true, but they leave a number of questions unanswered. A number of these are concerned with the form of the test-instrument. Since understanding was tested by selection of a picture, some of the illustrations from which the choice had to be made must have been bizarre, e.g.:-

- 1(b) The sheep that chased the man ate the grass;
- 2(a) The horse that raced past the car jumped  
a wall;
- 12(a) The girl who teased the puppies wrote on the  
paper.

It is difficult to explain how deaf children, who are not universally stupid, could be led to prefer pictures illustrating the underlined clauses which are improbable in



the extreme, before others illustrating more likely occurrences: sheep eating grass, a horse jumping a wall, a girl writing on paper and so on. Out of the 24 stimulus sentences 11 are similarly bizarre, if not downright impossible, 4 are unlikely while only 6 are theoretically possible, especially if some lexical items are poorly known:-

- 2(b) The car that raced past the horse hit a wall;
- 10(b) The lion that ran past the woman bit her hand.

Only 3 sentences represented probable happenings,

- 5(b) The lightning that followed the plane hit on the ground;
- 11(a) The water that floated in the bottles spilled on the floor;
- 11(b) The bottles that floated on the water fell on the floor.

It is highly probable that other, unrecognised processes are at work. Barclay (1975), has shown that, in selecting items from lists, the deaf tend to scan the whole list and then select the last item. No information is given in Davis' paper on the order of occurrence of response pictures. It may be that these results were partly contaminated at least by use of a similar response strategy. Alternatively, it is impossible to be certain what led the subjects to select one picture rather than another: the marked preference for improbable or unlikely illustrations

suggests that some children may have been utilising a strangeness-selection strategy. This seems plausible given the widely reported characteristics among deaf children of lexical impoverishment and inability in handling long sequences of words. An alternative explanation may be that the memory of Davis' partially-hearing subjects for orally presented sentences may have been less good than that of hearing children, especially when the input sentences were bizarre. This could lead to retention of only the most recently presented data, however nonsensical it may have seemed. Whatever the reasons, Davis' research reinforces earlier findings that the deaf prefer to operate on relatively short, simple sentences, that they cannot make use of functor words and that their knowledge of common lexical items appears to be limited or deviant. This last point further emphasizes the assertion made towards the end of Chapter I, that it may be unwise to assume that any given word or sequence of words has the same meaning when used by the deaf and the hearing.

#### Complement Structures

A number of studies of complement structures have also been made. Taylor (op. cit.) discovered a number of deviances from normal English, including marking of tense in the infinitive:-

The man began screamed,

and confusion over infinitival and gerundial usage:-

He cannot know how to swimming.

Quigley, Wilbur and Montanelli (1975) found that for the deaf complementation was more difficult than relativization. which, in turn, presented greater difficulties than conjunction. They concluded:-

Many types of complementation could not even be attempted by deaf students and ..... performance on these types that could be tested was only at the level of chance. (in Russell et al. 1976, p. 194).

Not only did the deaf produce deviant complement structures but they also accepted them as correct when presented with them.

These difficulties in handling complex and relatively long sentences are not unexpected. Early investigators are almost unanimous in reporting a preponderance of short, simple sentences in the utterances of the deaf. Thus these subjects have little experience of producing long and complex sentences. Since their reading ability is also limited (Fusfeld, 1955; Goetzinger & Rousey, 1959; Ives, 1970, and many others) the deaf, even at fairly advanced ages are restricted to reading only the simplest of books prepared for young children in which the matter is often trivial, the ideas limited and syntactic structures rather simple. Teachers of the deaf also commonly modify their own utterances in the direction of syntactic and semantic simplicity. Thus the majority of

deaf children will have had very little experience of and practice in interpreting longer and more complex sentences. Sheer lack of experience would explain many of the findings of this group of investigations. It is also probable that uncertainty as to the actual task to be performed and sheer lack of sophistication in test situations have also influenced the results. These are not the only constraints however, as will be shown later.

### Negation

Schmitt (1968) studied deaf children's understanding of negative sentences, using a multiple choice technique involving sets of pictures. The majority of his subjects between the ages of 8 and 17 years seemed to have a good receptive understanding of negative markers, but several of his younger subjects used a "no negative" rule, in which the marker NOT is ignored and sentences containing it are treated as affirmative.

Quigley, Montanelli and Wilbur (op. cit.) examined comprehensively the use of negation by deaf children. Below age 10 many of them accepted sentence initial and final negative emplacement in roughly equal proportions. This suggests a primitive rule that involves treating an utterance as a unit, the whole of which is negated. About 50% of the 10 year olds, in contrast, embedded the negative marker within the sentence, placing it immediately before the next phrase, which again appears to be treated as a complex syntactic unit:-

Dogs not can build nests

The feature declined in frequency to about 20% of occurrence at age 18, being replaced by a more normal English rule, with the negator embedded between the auxiliary and the verb.

A further part of this study involved an examination of the acceptability of standard and non-standard English negating contractions. Incorrect forms were accepted roughly 50% of the time at age 10 but declined to 10% by age 17, although different contractions were acceptable in varying proportions: almost 50% of 18 year olds accepted the forms willn't and amn't.

Question Forms

Quigley and his colleagues also revealed a parallel acceptance of normatively incorrect do support rules in interrogatives: 60% of 10 year olds judged acceptable wrong usage of do in questions. This proportion declined to just under  $\frac{1}{2}$  by age 17. In another study Quigley and his co-workers (Quigley et al., 1975) discovered that deaf children handled yes/no questions with greater confidence than WH- questions, which were in turn easier than tag-questions. Who in subject position was understood more correctly than when or who(m) (object). Quigley discovered parallels between the form of acceptable interrogatives and relativised sentences. For example, in relatives normatively incorrect deletion rules produced sentences that were accepted:-

John saw the boy who the boy kicked the ball.

In interrogatives there was a similar absence of deletion transformations:-

Who did the dog chase the boy?

### Passive Sentences

A number of workers have investigated comprehension and production of passive sentences by the deaf. Schmitt (op. cit.) reports that understanding of passives was more difficult for the deaf than understanding of actives up to the age of 14 years, and even by age 17 many of them had not mastered the construction. Passives are generally interpreted as actives, the pre-verbal NP being taken as the agent, the post-verbal as object in all cases.

Tervoort (1970) expanded this point; as a group his deaf subjects interpreted active sentences incorrectly in only 20% of cases, whereas passives were wrongly understood in 44% of instances. The difference is statistically highly significant ( $p < .01$ ). His control group of hearing children made correct interpretations in both cases 100% of the time. Tervoort showed that his deaf subjects' performance improved with age: deaf children younger than 13 years were wrong in three cases out of every four, while in children older than this the error-rate had dropped to approximately one in five. The differences between the age groups would undoubtedly have been greater but for four

of the younger subjects who responded correctly to all passives, apparently because they interpreted all sentences from right to left, i.e. treating pre-verbal NP's as objects and post-verbal NP's as subjects.

For Tervoort the problem facing the deaf seemed to be that the expectancy created by the first NP in a sentence (that it functioned as an agentive) does not hold in the passive. His subjects rejected (correctly):-

The T.V. set repaired the man.

but they also refused to accept:-

The T.V. set has been repaired again.

This may also arise from a lack of understanding of the passive markers: be V-ed and by (where it occurred).

Power and Quigley (1973) also report that nearly 40% of their deaf 17-18 year old subjects processed passive sentences incorrectly. They examined the comprehension and production of non-reversible passives (The soldier was killed) which were easier than reversibles (The girl was kicked by the boy), while agent-deleted passives were very difficult, with error rates of 70%.

An important change occurred at about the ages of

12 and 13, with a sudden increase in accuracy by older children. Production of passive sentences lagged far behind comprehension: the only statistically significant measure of development in this was between the 17 and 18 year olds on the one hand and the 9-10 year olds on the other. Even at age 18 production scores failed to reach a correctness level of 50% and the lack of uncertainty is indicated by the size of standard deviations which exceed the mean scores at each age.<sup>x</sup> In contrast almost all the hearing children used as an experimental control group had mastered both production and comprehension of passive sentences by the age of eight. The authors comment:-

Apparently deaf children .... very often use only the by of the agent phrase as the marker for passives. When, as in the agent-deleted sentences of the comprehension task, the by phrase is missing, their ability to interpret correctly the remaining verb markers (was V-ed) of the passive is greatly reduced (op. cit., p. 9).

- 
- x This sort of finding, often repeated in statistically based research, should be approached with considerable caution. Such measures as mean and standard deviation are technically parameters of a continuous, normal distribution, represented mathematically by

$$y = \frac{N}{\sigma \sqrt{2\pi}} e^{-\frac{x^2}{2\sigma^2}}$$

The nature of the curve represented by this formula indicates that 99.999% of all cases lie between the mean  $\pm 3$  standard deviations (SD). Where the SD is greater than the mean this cannot apply and parametric statistical tests should not be used. Expressed differently, use of such measures makes assumptions about the distribution of language scores (i.e. that they are normally distributed). It is doubtful whether such an assumption has any meaning in most cases statistical or otherwise



Children who failed in comprehension rarely used by in their attempts at production. In contrast, those who understood passives correctly also usually included by in the passives they produced, but they made errors in the form of the verbal phrase.

There may be more than one reason for the difficulties experienced by the deaf in handling passives. Passives occur rather rarely in normal language and, since teachers of the deaf simplify their own language in the direction of short, active, S-V-O structures, many deaf children may never have encountered a passive sentence. But this cannot be the only reason: the deaf are poor in understanding auxiliary verbs and prepositions, so that, even if they were to meet a passive sentence they would probably be unable to understand it. As a result learning would be impossible and the structure would be unlikely to enter their cognitive grammatical model.

The investigations discussed in this chapter have, for the most part, involved a study of the major systemic aspects of the language of deaf children, focusing more or less comprehensively on the rules they appear to use in generating and understanding sentences (or, more accurately, on a statement of rules that might account for the sentences produced and on the cognitive strategies and processes involved in interpreting language inputs).

### Other Studies

In addition there have been a small number of studies with a more restricted aim. Wilbur, Montanelli and Quigley (1975) examined the use and understanding of pronominal forms by the deaf. They discovered that:-

- (1) subject and object pronouns were better understood than possessive adjectives;
- (2) possessive adjectives were more often correctly understood than possessive pronouns;
- (3) singular pronouns proved easier to handle than plurals for all cases;
- (4) the first person pronoun was used more correctly and earlier than the third person, and use of second person was further delayed;
- (5) except in the case of reflexives, which were roughly equal in difficulty, masculines were easier than feminines. Neuters provided greatest difficulty.

The authors concluded:-

Comparison with studies of pronominalisation in hearing children's language indicated that the greatest difference for deaf students appeared to be a profound retardation in acquisition rather than consistent deviances such as those found in other structures. (p. 153).

A similar conclusion was reached by Jarvella and Lubinsky (1975), studying the use of language in describing temporal sequencing:-

In most respects the deaf children's linguistic performance resembled that of much younger hearing children. (p. 58).

In this study it was found, once again, that the deaf used simple sentences and responded to multiple-clause sentences "as though the events being described had occurred in the order they were mentioned" (p. 58). Hearing children used more time-words (conjunctions and adverbs) and verb-tense inflections than the deaf in making explicit reference to temporal distinctions. The hearing children rarely used before or after but regularly used and, and then, then, and so, now, etc. The deaf children never used before or after and very rarely used the other forms.

The hearing subjects almost always marked verb-tense when it was called for and tended to use a single tense consistently within their descriptions. But the deaf subjects, and particularly the younger ones, often used no verb inflections in their descriptions. (p. 63).

The language of the hearing was relatively elaborate with frequent and clear marking of inter-sentence relations. In contrast, for the deaf the dominant form was a sequence of simple sentences, one to each picture in the sequence being described, with each picture being treated as if it were a separate incident.

In another study Cooper (1965) attempted to compare the knowledge of deaf and hearing children of standard English morphological rules, using a modified form of the test developed by Berko (1958). A large group of severely deaf children attending a residential school for the deaf

in New York were tested. Discrepancies in the performance of the deaf and hearing were noted, with 19 year old deaf girls achieving lower scores than 9-10 year old hearing girls. Although the scores of the hearing girls continued to rise throughout the age range studied, those of the deaf reached a constant level at age 15. The scores of hearing boys rose until the age of 12 but development ceased among the deaf boys at 9 years. Patterns of item-difficulty were similar for both groups and all children found inflectional rules (that is the more mechanical aspects) more easy to apply than derivational ones. It was differences in the application of derivational rules that most clearly distinguished between the hearing and the deaf.

The greatest part of the work described in this chapter has been carried out more or less directly within the theoretical framework of post-Chomskyan transformational-generative grammar, with an emphasis on the discovery of the cognitive-linguistic rules underlying the surface forms of utterances. In contrast, one paper has adopted a tagmemic approach (West & Weber, 1974). This different orientation, together with the fact that only a single very young child (aged 4) with relatively slight hearing loss was tested makes difficult any attempt at integrating conclusions with the main stream of research. The authors analysed tape-recorded spontaneous utterances on the basis of privileges of occurrence of different word-classes. In this case

word-classes were not defined a priori but were drawn up in terms of the data being analysed. The child produced various one-, two- and rare three-word utterances of the following forms:-

verb + adverb	noun + verb
verb + noun	noun + noun
verb + noun + adverb	dem. + noun

and the authors believe that they can, in these forms, detect the emergence of basic syntactic functions: topic, modifier, subject-of-sentence, predicate-of-sentence and object-of-sentence.

No systematic studies have been made of the earliest stages in the development of syntax of profoundly deaf children, but the existence of a fully-fledged, independent system in these children by the age of 10 years, together with the commonly observed attempts of 7-8 year olds to communicate by means of one-and two-word utterances, often paralleled or supplemented by naturalistic manual gestures and some conventional signs, suggests that similar processes may be operating with their children.

Although the set of investigations described here mark a definite advance on the earlier statistically-based research we may be confident that the same phenomena are being studied: the utterances being analysed are, for the

most part, short and simple and deaf children appear to be fairly narrowly restricted in their ability to produce and interpret sentences of even moderate complexity. The simple sentences produced contain many apparent deviancies from standard English structures, notably in the part played by various modifying and refining devices (prepositions, auxiliaries, deictics, subordinate clauses, etc.). The language of the profoundly deaf is notably impoverished in vocabulary. Each of these features has been described in earlier research, but what marks a distinct advance is that these features as a whole can be shown to form, not a mere concatenation of random errors, but an integrated symbolic system that is used regularly both to transduce inner cognitive events (i.e. sequences and complexes of meanings) into external, public linguistic events (i.e. speech and writing) and also to interpret the linguistic events to which the deaf are exposed. Thus, we may conclude that what is being analysed is a language system sui-generis. Most workers conclude that, inspite of the existence of some deviant features, this system has close affinities with the early developmental stages of standard English. Ivimey (1977<sup>(c)</sup>) has given some evidence for this based on a comparison between the systematic errors made by foreign students learning English (Richards, 1974), the syntactic systems of deaf adolescents (Ivimey and Lachterman, .op. cit.) and the emergent structures seen in the language of normally hearing children acquiring English under optimal conditions (Bellugi and Brown, 1964; McNeill, 1966). More detailed parallels

and similarities have been shown in the development of negation, interrogative, relativization and pronominalization by the authors whose work has been described in this chapter. Only one investigator (Perry, op. cit.) argues against this position. However, Perry's approach rested heavily on a statistical-computational methodology on the one hand and on ratings made by judges of the syntactic complexity and vocabulary of the language of deaf children on the other. Although he notes that his judges

had more difficulty in separating sentences written by older deaf and younger hearing children than younger deaf and older hearing children (op. cit., p. 14).

and accepts that the structures used by the deaf may approximate closely to those of hearing children younger than those he studied, he concluded:-

The results of the comparative analysis (based on the acceptability by subjects of normatively incorrect sentences - G.P.1.) show that all the errors made by the hearing sample were 'performance' errors, and although all the deaf sample made similar errors, some of the errors made by the latter sample were due to what may be defined as a deviant competence. (ibid.)

However, since Perry did not make any detailed analysis of his material as a system but seems to have relied mainly on an impressionistic approach in which no criteria are offered for defining performance and competence errors, it is difficult to evaluate his contribution which runs counter to the

greater part of research in the past decade. It is probable that most of the "errors" produced by deaf children are systematic and are similar to those made by younger normally hearing children that there are, in addition, personal and group idiosyncracies, reflecting to a great extent the nature and amount of language input experienced by different children (Ivimey, 1976).

#### Methodological Problems

In spite of the advantages of this newer linguistic (sensu stricto) orientation to language as a coherent system and the advances it has given in an understanding of the subject, the investigations described have some obvious shortcomings.

Of these the most obvious - that the greatest amount of research is based on written, rather than spoken, language - is probably inevitable. Even at age 16 or 17 the speech of the majority of profoundly deaf children is very defective, rendering difficult or impossible any analysis of spoken utterances, even where the topics being discussed and the contexts in which the language is used are known. Language recorded on tape even of children whom teachers judge to have "good speech" is generally incomprehensible to the teachers themselves.

Other methodological short-comings appear not to have been recognised as such. Thus Taylor's work was based



on written spontaneous reproductions of a silent film. Many, perhaps most, linguists express a preference for spontaneously or semi-spontaneously produced material and there are occasions when it may, indeed, be useful, provided certain precautions are taken. But reliance on spontaneously produced language causes a large number of problems. The most obvious of these is that language produced in a wide range of situations should be obtained so that a variety of style and topic may be sampled. Taylor's work clearly fails to meet this requirement, since only one context and one style was sampled.

Other more latent disabilities may also operate: the language obtained should also contain a range of syntactic structures that are congruent with those of some hypothesized linguistic domain. Initially the structure of this domain is unknown and investigators must sample it intuitively, yet in relying on spontaneously produced utterances the investigator loses all control over the syntactic sampling. Some structures may not appear in the sample at all: in this case the investigator has no means of knowing whether the omission results from ignorance of the structure by the producer or whether the context of the language sample did not call for use of the structure, which may be well-known and utilised in other contexts. A third possibility is that the producer has some knowledge of the structure, but is aware that his knowledge is faulty and, in

order to avoid error, decides not to use it. It is unlikely that the majority of deaf children has reached this level of sophistication, but it must clearly remain a possibility and reliance on spontaneously produced data adds additional, often unrecognised, dimensions of uncertainty to investigations.

Alternatively, some structures may appear but so infrequently as to prevent analyses (Steinkamp & Quigley, 1977) In this case a single normatively correct form may cause the investigator to overestimate the linguistic competence of the producer. That this is a real possibility can be seen in the author's personal work. This involved collecting between four and six spontaneously written samples from each of twenty children totalling 1,934 "sentences" in all. This total corpus of data included sentences of the following types:-

<u>type</u>	<u>number</u>	<u>%</u>
declarative affirmatives	1789	93
negatives	10	< 1
interrogatives	57	3
imperatives	38	2
others (mainly causal)	40	2

In addition there was a small number of unclassifiable sentences usually so distorted or fragmentary as to be incapable of interpretation. Some children produced no

negatives at all, while many of the interrogatives appeared to be learned units (what is the matter?). These were generally unproductive and contrasted strongly with those generated by rule (e.g. what he do?), when the latter occurred.

Other problems may also arise out of a reliance on spontaneously produced data. We have already seen that this removes from the investigator control over sampling of the syntax. It also renders interpretation difficult by adding lexical confusions. Impoverishment of vocabulary in the deaf is widely reported, and it is possible that lack of vocabulary may force children into clumsy and not very accurate paraphrasing attempts in order to express even simple ideas. Alternatively, ignorance of specific words may lead a child to omit one or more sentences that he could otherwise have written.

In spontaneous data there may also be some ambiguity as to the actual reference of terms used. This point has already been made in connection with a lack of semantic congruence between words as used by the deaf and the hearing. Other items may be equally ambiguous. Many deaf children produce verbs unmarked for time reference (Bamford and Bench in press; Ivimey and Lachterman, op. cit.; Jarvella and Lubinsky, op. cit.) or - the majority of cases - in past tense form (Ivimey, 1976<sup>(a)</sup>). In both cases the time reference seems to have little relation to the form of the

verb. But, since the majority of the written work of the deaf (stories, diaries, "News", etc.) involves descriptions in which pastness is appropriate or at least expected, if the children use verbs in past form, teachers and investigators may be led to believe that their pupils are more sophisticated than they are in reality. Equally, frequently reported errors, involving juxtaposition of verbs formally present and past, have been difficult to interpret. In some cases this has caused investigators to conclude that the deaf have no knowledge of the sequence of tenses, or that their language consists of dislocated or poorly related sequences of sentences (Heider and Heider, op. cit., and many others). Such sequences, poorly inter-related in terms of time reference, have contributed to the categorisation of the language of the deaf as error-full. It will be shown in Chapter III that this interpretation may be incorrect.

A final disability arising from a reliance on spontaneous data appears not to have been noted by most investigators. They report frequently that the lexical and syntactic skills of quite old deaf children resemble those of much younger hearing children, possibly as young as 3-5 years of age. Yet their subjects have been required to write on topics appropriate to their chronological age. This discrepancy between task and the linguistic tools available to perform it must surely lead to breakdown

and may account for the large number of structureless sentences that appear so frequently in the language of deaf children.

We see, therefore, that a reliance on spontaneous data carries with it some great problems: the investigator loses control of a great part of his research, the data that are obtained may be wrongly interpreted or totally incapable of interpretation, the tasks set for the children may place too great a strain on their rather limited linguistic ability. As a result conclusions must always be tentative and there is a very real possibility that the language competence of the deaf children being studied may be either over- or under-estimated.

An attempt to overcome these disabilities has been made in a number of investigations at the University of Illinois, but, once again, the alternative approach raises serious problems. Here, the general research paradigm has involved presenting the children being tested with standard English forms and requiring them to perform certain specific transformations or tasks in the forms. The simplest task is to complete a sentence with one or more words omitted ("fill-in-the-blank", Wilbur et al., 1975). In other cases the children may select one answer from among several examples. Elsewhere they may use the "Right-Wrong-Rewrite" format (ibid.). This involves an initial categorisation of the presented form as 'right' or 'wrong' and, if the

latter, then the subjects are required to rewrite the sentence as they think correctly (Power and Quigley, 1973).

These procedures overcome two of the disabilities described above of relying on spontaneous data: in the first place, the type and amount of data can be controlled. As many negatives, interrogatives, etc. as required for analysis can be obtained. A second advantage is that the input of information to the child's hypothesized language producing and interpreting system can be controlled, so that reference of forms obtained can be fairly certainly known.

However this methodology entails in turn a serious disability, i.e. the fundamental but largely unexamined assumption that the deaf subjects are naturally using a form of English. Were this not so, there would be little point in expecting them to operate on normal English sentences. Yet a logically and methodologically prior problem is to determine whether, and to what extent, the subjects are actually using a form of English syntax and semantics. To fail to do this is to prejudge the central question. Almost every investigation described has included frequent use of the term "errors" in describing the language system of the deaf and the majority, even of the systemic analyses described in this chapter, have depended heavily on statistical comparisons of numbers of errors made by deaf children of different ages and control groups of hearing

children. This procedure betrays the basic assumption that the syntactic and semantic systems of the deaf are a variant of normal English.

Even Taylor betrays this methodological assumption, although she recognises that several workers with normal children (Braine, 1963; Ervin and Miller, 1964; Menyuk, 1963(a), 1963(b), 1964(a), 1964(b)):-

have demonstrated the feasibility of making inferences about the nature of a child's linguistic competence, his internalized rules for producing and understanding sentences in the basis of a finite sample of his language performance. (op. cit., p. 3).

Although she gives some outlines of a transformational grammar that accounts for the major structures produced by her subjects she does not pursue this to the point where she could discover whether the rules utilised by the deaf were different or similar, and in what degree, to those of the hearing control. She reports:-

one of the more important findings of this research is evidence indicating that the congenitally deaf children's language performance is the product of a system of rules. (ibid., p. 64).

but gives no coherent account of these rules (at least in the published account of her work) being ratified with quoting illustrative evidence from the written accounts

of individual children. Instead much of her work involves an analysis of normal English rules violated, number and variety of constructions used and various quantitative indices developed by Hunt (1965, 1966).

A third major short-coming<sup>x</sup> derives from the general theoretical orientation of the research described in this chapter, i.e. within the transformational-generative paradigm developed by Chomsky (1954, 1965) and his co-workers. Now, Chomsky wrote:-

observed use of language ..... may provide evidence as to the nature of this mental reality, but surely cannot constitute the actual subject matter of linguistics. (Chomsky, 1964, p. 4).

The basis for this assertion is the assumption, usually stated rather than rigorously demonstrated, that language performance is characterised by multiple errors, deriving from:-

such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying .... knowledge of the language in actual performance. (ibid., p. 3).

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x The following points will be placed, in Chapter IV in a larger framework of the methodology of linguistic research.



In its strongest form such a claim must surely negate any attempt at analysing a language system which is apparently replete with errors: any attempt at detecting rules underlying regularities within these "errors" is irrelevant unless one is given, or can obtain, an independent a priori categorisation of which features of performance are errors as defined by Chomsky and which are the surface exponents of genuine cognitive-linguistic rules. Such an interpretation is clearly extreme: without performance data of some sort there can be no evidence as the nature, structure and functioning of the "underlying system of rules that has been mastered by the speaker-hearer". (ibid., p. 4).

Accordingly, it seems that a study of performance data may be useful and relevant, but only as a first stage: the ultimate aim of the investigator is to:-

attempt to categorize in the most neutral possible terms the knowledge of language that provides the basis for actual use of language by a speaker-hearer. (ibid., p. 9).

However, this knowledge is not accessible to direct inspection, and, even when a student has produced a set of explicit statements about this hypothesised linguistic rule-structure, that is when he has written a grammar or "description of the ideal speaker-hearer's competence" (ibid., p. 4), this grammar must be checked:-

for adequacy ..... by measuring it against the standard provided by the tacit knowledge that it attempts to specify and describe. (ibid., p. 19).

Thus Chomsky proposes as an operational test of linguistic description that it must meet:-

the empirical condition of conforming, in a mass of crucial and clear cases, to the linguistic intuition of the native speaker concerning such elements. (ibid., p. 19).

Later, Chomsky reiterates:-

A grammar can be regarded as a theory of language: it is descriptively adequate to the extent that it correctly describes the intrinsic competence of the idealized native speaker. The structural descriptions assigned to sentences by the grammar, the distinctions that it makes between well-formed and deviant, and so on, must for descriptive adequacy correspond to the linguistic intuition of a native speaker (whether or not he may be immediately aware of this) in a substantial and significant class of crucial cases. (ibid., p. 24).

In none of the investigations cited has any attempt been made to carry out the crucial tests demanded by Chomsky, and it is unlikely that, given the lack of linguistic and cognitive sophistication of deaf children, they could usefully produce relevant judgements based on introspection. Accordingly none of the researches is, within the theoretical framework adopted by the authors, descriptively adequate. This point is not trivial: authors have analysed the sentences of deaf children in terms of hypothesized deep-structures commonly used by transformationalists to describe

normal English. One of their major conclusions is that the rules utilised by deaf children resemble rather closely those of more juvenile speakers of standard English, but since the rules in question have been isolated and described in terms of a hypothetical model of English, the conclusion is tautological.

In the case of the research discussed here this circularity of reasoning appears to have been implicit, or at least unacknowledged. Morehead and Ingram in a similar paper also within the transformationalist paradigm have been more explicit. The utterances of the children (in this case suffering from language disorders) whom they studied were expanded:-

The expansion of the child's utterance was determined by the contextual information collected when the language sample was taken. In this way the child's intended grammatical and syntactic relations were more closely approximated than by tape recordings or by observational records alone. (Morehead & Ingram, 1973, p. 334. *Italics supplied*).

The conclusions of Morehead and Ingram closely parallel those of the workers with deaf children.

Linguistically deviant children do not develop bizarre linguistic systems that are qualitatively different from normal children. Rather, they develop quite similar linguistic systems with a marked delay in the onset and acquisition time. (op. cit., p. 344).

These conclusions may well be justified but since nowhere are we presented with original data, uncontaminated<sup>a</sup> by the intuitions of the researchers as to the subjects' intentions, we are unable to accept or reject them. In place of Chomsky's idealised native speaker-hearer of the language system in question, the grammars that are produced are checked for adequacy against the intuitions of an idealised native speaker-hearer of standard English.

S E C T I O N   T W O

Controlled elicitation sampling  
studies of the language of deaf  
children

### CHAPTER III

#### The early work of Ivimey and his students

In the preceding chapter it has been argued that serious, linguistic analysis of the utterances of deaf children places certain constraints upon an investigator:-

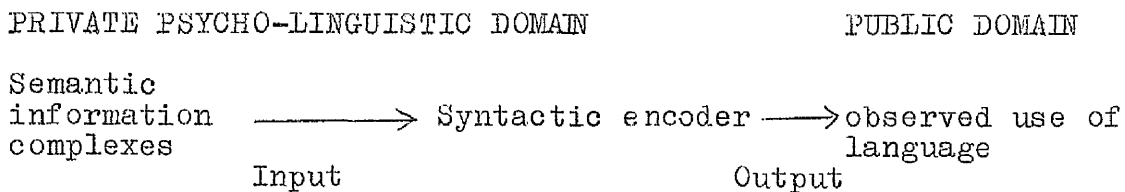
- 1) the analysis must reflect the essentially systemic nature of the material being studied and should avoid largely irrelevant, mechanically-derived measures, however desirable these may be for purposes of statistical analysis;
- 2) the investigator must retain full control over the linguistic structures that are obtained for study: sampling must be controlled and should not depend on largely fortuitous factors of style, mood and opportunity;
- 3) the structures obtained in the sample must be fully representative of the total language domain that is being studied;
- 4) as far as possible a syntactic analysis should be made of data, based on similar semantic inputs (= semantic neutrality). It is clearly impossible to separate syntax and lexis, but certain procedures may reduce or avoid possible lexical ambiguities.

A number of investigations into the syntactic competence of deaf children have been carried out by the author and his students at the University of London Institute of Education, within the limits imposed by these constraints.

These investigations have taken place within the framework of a psycholinguistic model which sees humans as processors of information, in this case of semantic informa-

tion. In this context "information" is conceived as a private, inner state of affairs: complexly interrelated and structured constellations of cognitive, factual meanings, desires, emotions, etc. that are accessible only to the person who is experiencing them. In order for these private events to become public they must be altered into series of observable events. One way of achieving this alteration is by passing the private events through a series of encoding devices, of which one of the more important is a hypothetical syntactic system.

This process may be represented schematically as follows:-



The syntactic encoder is not entirely independent: it affects and is affected by the contents and structure of the semantic complexes. Certain element sequences in the private-event domain constrain the range of syntactic codes that may be applied. Equally the nature of the syntactic codes may themselves constrain to a greater or lesser degree the expression of possible sequences and colligations of elements in the private domain. However, for the purposes of this initial, excessively simplistic model, it will be assumed that syntax receives, as a largely independent set of structures and processes, semantic information on which

it operates.

In this model the major normal input to the syntactic encoder (which may be followed by various motor encoding operations, depending on the nature and modality of output expected) is provided by elements within the private domain. However, the encoder is also susceptible to external manipulation: an investigator may, under certain circumstances feed an external input or inputs into the encoding system.

Thus we may conceive a situation in which an experimental subject sees a card with a picture, say, of a man striking a boy. This presumably causes some perceptual-cognitive processes to occur within the subject and, if he is asked to say or write something about the picture, these processes will act as input to his syntactic and motor encoding systems. The resultant utterance represents the output from this:-

<u>Input</u>		<u>Output</u>
picture: man striking boy	→	<u>Daddy slap boy</u>

(Ivimey, 1976a)

Further information about semantic input can be elicited by asking the child whether the output utterance refers to present, past or future time. In the case above the subject



replied: Now, i.e. present.

Subsequent manipulations can be performed on the input to the syntactic encoder: the investigator instructs the subject: Good, now write/say the same, but say "Yesterday .....":-

<u>Input</u>	<u>Output</u>
picture + novel time reference	→ <u>Daddy slap boy finished</u>

The manipulative process continues with varying time references, negatives, interrogatives and so on being elicited. This process is very similar to that of a cyberneticist (Ashby, 1964; Wiener, 1950). In this case the syntactic encoder is seen as a classic "Black Box" whose internal structures and functioning are unknown and cannot be directly observed:-

The problem of the Black Box arose in electrical engineering. The engineer is given a sealed box that has terminals for input to which he may bring any ..... disturbances he pleases and terminals for output from which he may observe what he can. He is to deduce what he can of its contents. (Ashby, op. cit., p. 86).

In more realistic, every-day situations the Black Box may be represented by an explosive device, by delicate apparatus which may be destroyed on opening (e.g. a bomb-sight), by the human head and so on.

When faced with such an enigmatic object there are

a number of things an observer may do. Of these the simplest is to record any outputs or behaviour that may occur (apparently) spontaneously. In such a case the problem becomes one of determining which of the many possible outputs are likely to be most useful and which should be recorded, as opposed to those that are categorised as irrelevant and that may be ignored. The most primitive procedure is to record the number of emissions (of whatever sort) per unit of time. This is closely analogous to measurements of mean length of utterance (i.e. mean number of words uttered per unit of grammatical structure), parts of speech per sentence and so on. It has been argued earlier that such an approach is unfruitful for many reasons, of which the most important is that such records throw little light on the basic problem: of discovering the internal structure and mode of functioning of the Black Box. In large part this is because (in cybernetic terms) the output and (presumed) inputs are indeterminate: there is no evidence that the system is either closed or characterised by one-one relations (Ashley, 1964). Any single input or combination of inputs may be responsible for any single output or combination of outputs. In more conventional linguistic terms there is too much variation and uncertainty of output for reliable and accurate conclusions to be drawn (Crystal et al., 1976 pp. 9 - 11). Taylor (op. cit.) has discussed this problem at length. She noted serious discrepancies between different investigators. Thus Simmons and the Heiders (op. cit.) agree that

deaf children show an increase in mean length of utterance with age, but Simmons' deaf 9 year olds wrote longer sentences than the Heiders' 14 year olds. This may have been due to improvements in teaching (although there is no evidence of this), but on the basis of several comparisons, Taylor concludes that

There must be some serious source of error when the findings within a single investigation seem always to come to the same conclusion but when the raw data of one investigation are so radically different from the raw data of another. (op. cit., p. 16).

Equally, it has been shown that any attempt to detect elements of a system in data emitted purely spontaneously raises many problems, notably those of handling data that are emitted so rarely that no pattern can be detected or, indeed, those of detecting patterns in the possible total absence of any data at all!

A more fruitful procedure is to explore the capacity of the black box by systematically varying input stimuli and by recording the outputs that correlate with these inputs in order to detect possible regular relationships between them. If it can be shown that these relationships are regular and determinate (i.e. closed and one-one) then the black box may be shown to possess regular structure. Thereafter this structure may be susceptible of description and the description will, in the case of a syntactic black box, form a grammar. In this view a grammar is a transducing system that accepts semantic inputs and transforms them into what,

after further processing, will become written or spoken utterances.

This is a brief description of the theoretical position used implicitly by Ivimey and his students in London. A group of eleven profoundly deaf children aged between 10 and 11 years were approached with no assumptions as to whether they had access to an English syntactic encoding system, or indeed to any structured syntactic knowledge at all. The fundamental problem was:-

Is the language of the deaf ..... a loose calligation of everyday English words, placed alongside each other without system, or is it based on a set of systematically ordered rules? (Ivimey, 1976(a), p. 106).

Each child was shown individually and seriatim a set of coloured pictures of

- i) a big boy hitting a smaller boy,
- ii) two girls kicking a boy,
- iii) a boy climbing a tree,
- iv) a boy and girl watching television,
- v) a dog biting a postman.

In a pilot experiment pictures showing incidents involving plural syntactic objects were used also, in order to detect (a) whether there were any systematic differences of number-marking in subject and object positions, and (b) whether, if

any children processed sentences from right to left, as Tervoort noted (op. cit.), this had any influence on subject-verb concord. Since no systematic examples of these could be noted, the additional cards were abandoned in order to conserve the time needed to administer the test.

In addition a number of pictures were used to elicit intransitive sentences:-

- vi) a boy falling over a stone,
- vii) a boy walking to school,
- viii) a baby sleeping.

These stimulus cards were also intended to elicit prepositional phrases. Other sentence structures elicited were:

- ix) direct and indirect objects,
- x) sentences containing be followed by predicate adjectives and NP complements,
- xi) sentences indicating possession by use of have.

These cards, together with other stimuli (spoken, written and communicated in conventional deaf gesture language) to elicit a range of tense and aspect, negatives and interrogatives formed the input to the syntactic transducer. The two sets of stimuli (cards and instruction words or signs) were combined in different ways in order to elicit a variety of sentences involving several different rules:

futures or pasts and negatives or interrogatives of both performative and attributive (be, have) verbs. In general the children seemed able successfully to handle inputs involving up to three combined rules: picture + time reference + negation or interrogation, but attempts at combining four rules (i.e. picture + time + negation + interrogation giving, for example, a sentence like:-

Won't they be watching t.v. tonight?

proved too difficult for all the deaf children studied.

The aim of combining the stimuli in these different ways was to secure at least three or four sentences with examples of each process, since it was felt intuitively that fewer than three exemplars would not allow patterns of performance to be detected, while to seek more than four would lengthen inordinately the data-collecting sessions, place too great a burden on the relatively unsophisticated subjects and run the risk of alienating teachers who did not like children being absent from class for too long a period. In the event, the average number of forms elicited per child were as follows:-

	<u>Present</u>		<u>Future</u>	<u>Past</u>
	<u>Progressive</u>	<u>Habitual</u>		
<u>Declaratives</u>	8	3	6	6
<u>Negatives</u>	6	3	3	3
<u>Interrogatives</u>	7		2	2
<u>be</u> - declarative	4		2	2
negative	1		1	1
<u>have</u> - declarative	3		2	2
negative	2		1	1
<u>Double-object sentences</u>			3 } time reference varying	
<u>Intransitive-verb sentences</u>				

Great difficulty was experienced in eliciting sentences containing be and have. In part this was due to problems of illustrating these forms, but the greatest difficulties seem to have arisen from delayed conceptual development, so that these verbs did not form a stable part of the children's linguistic repertoire, a point of great theoretical and developmental importance (Ivimey, in manuscript). They are discussed more fully later.

The data were subsequently analysed by inspection for regularities of occurrence and a descriptive form adopted that attempted to preserve the systems nature of language.

In this way the essential requisites for linguistic research, set out at the beginning of this chapter were met;

- (a) (Requirements 2 and 3) The investigator has retained full control over the type of structures and the numbers of exemplars of each structure sampled. Since any naturally occurring organic black box has a very large number of possible inputs and outputs, a preliminary study will involve an investigator using a largely intuitive sampling process and those structures examined reflect this. However they seem to be fundamental to any form of information - making declarations, negating, asking questions, varying these for different time references, allowing for the transmission of objects from one person to another and examining some aspects of locational and directional specification, and so on. Most obvious omissions include the absence of passive sentences, which have generally been shown to be poorly handled by the deaf. This absence is not heuristically serious: until active sentences and the use of auxiliaries and prepositions have been studied in some detail, little of value is likely to come out of a study of passives. More serious, perhaps, is the absence of elicited complex and compound sentences. However, over half a century of work has shown that the deaf neither frequently nor spontaneously use such sentences, nor do they appear to be skilled in interpreting them. A study of the structures of simple sentences is logically prior and, until this has been carried out, little valuable information is likely to come out of a study of more complex embedding, conjoining and other processes.



In fact, some children did produce such complex forms spontaneously and these have been tentatively analysed along with other data.

(b) Utilisation of the same limited and largely concrete vocabulary for all subjects preserves to some extent the requirement of semantic neutrality (requirement 4).

(c) The analysis - a detection and description of rules, i.e. the relationships between the elements included in each sentence, preserves the essential systematicity of the phenomenon being studied (requirement 1), and must be carried out in terms of the language itself, not of any other language. The analysis carried out on the data elicited enables us to conclude that deaf children do, indeed, make use of a set of systematically ordered and structured rules in order to make explicit any meaning complexes they wish to communicate. These rules can be described and summarised as follows:-

(1) The majority (over 70%) of the group of 10 - 11 year olds use rather similar rules to produce declarative and negative sentences, while all children form interrogatives on the basis of similar rules. Three of the subjects were rather more advanced in the rules they used to generate declaratives, this advance being seen in the emergence of a morphological system in verbal

structures and a greater richness of modification of nominal structures through use of prepositions.

- (2) For the larger, less advanced group a basic sentence generating sequence of rules may be represented:

$$S \rightarrow (TM) + S$$
$$S \rightarrow NP_s + VP$$
$$VP \rightarrow \text{Unit verb} + NP_o$$

Here TM = time marker (probably a contamination from the eliciting process but was omitted by some children in many sentences).

Unit verb is the most interesting feature of this grammar.

Verbs may appear either in normal English present or past form,<sup>x</sup> but the form has no regular semantic-signalling function. Each verb tends to preserve this form throughout all overt changes of time and aspect reference. Thus we find one child producing the following series of sentences:-

- a) Unit verb with normatively present form:

The man punch the boy (present time indicated)

Tomorrow the man punch the boy

Before the man punch the boy

(Here, before is a time-marker with past reference)

---

x It is interesting that Bamford and Bench (in press) approaching the language of partially hearing children from a rather different standpoint reflect this usage. In the case of the subject whose language they quote the verbs appear to be in the present tense. It is assumed by Bamford and Bench that these verbs have present time reference.

- b) Unit verb with normatively past form:

The two children looked the television (present  
reference)

Tomorrow Mary and John looked the television

Yesterday Mary and John looked the television

Evidence for lack of semantic and formal congruence may be expressed statistically: a verb in normal English present form is as likely to refer to past as to present time; a verb in past form is three times more likely to have present reference than past; will, where it is used, is confined to future time reference, but futurity is more likely to be indicated by a verb in present or past form.<sup>x</sup>

- (3) Nominal phrases tend to be characterised by simplicity, little use being made of adjectives as modifiers.
- (4) Within nominals there is a strong tendency (occurring in 10 out of 11 protocols) to use only one determiner at most in a sequence of contiguous nouns, although a determiner may appear with both subject and object noun phrases:-

The boy is give present the man

The girl give bone the dog

(i.e. the object N.P. = N det N)

Very little use is made of indefinite articles and it may be that here we see a systematic difference between the, marking definiteness and  $\emptyset$ , indefiniteness.

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x Actual values and percentages, where relevant, are given in Ivimey and Lachterman's paper, Appendix C.

- (5) Possession is normally indicated by mere juxtaposition:

The dog bite postman leg

The two girl kick knee and bottom boy

Some children use apostrophe "s" to indicate possession, but apparently with constraints. The form may appear in either NP<sub>subject</sub> or NP<sub>object</sub> position, never (in this sample) in both:

David's father slap David head

This may indicate a cognitive planning constraint on longer utterances similar to that noted by Huttner (1977) in the early speech of a French child.

- (6) Although number marking in the noun is incorrect in the preceding example most of the children in the group indicate number differences correctly in the normal English manner.

- (7) Prepositional usage shows some interesting features. At first glance the sentences appear to be very anomalous: expected prepositions do not occur; in some cases no preposition is used, elsewhere a preposition may be found but often normatively wrong forms are used. Thus we may find sentences like:

The two girl kick knee and bottom boy (for of the boy)

Daddy very cross boy (for with the boy)

The two children looked the television

Apparently bizarre forms, like

He fell down up the tree

may reflect some semantic deviance from normal English, where fell down is seen as a single unit, not a verb followed by a directional indicator. Other similar units appear to be fall over, climb up, kick to and slap to, used by several children quite regularly.

Underlying this apparent confusion is some conceptual regularity. Locational and directional prepositions, which are often concrete and easily demonstrable in class-teaching situations, occur quite frequently. In contrast, very few children have developed the dative form:

John gave a present the baby

The girls gave a bone the dog

Purely syntactic usages that often do not form a

demonstrable system do not occur at all:

Daddy very cross boy

This is closely similar to the general absence of to in phrases like:

He want go.

In general it seems that by this stage most of the children have acquired concrete, locational and directional forms; a few are beginning to sort out the moderately regular use of dative to, (which is rather less concrete and inconsistent in use:

compare verb + D.O. + to to I.Q. and verb + I.O. + D.O.), while none has reached the level of conceptual sophisti-

cation represented by conventional and purely syntactic devices.

Three of the children tested, while producing similar nominal and prepositional structures to the group taken as a whole showed an advance in the encoding of semantic information in verbal phrases. An incipient morphology is developing, still with considerable hesitation and uncertainty and the influence of the more primitive unit verb is still widely seen. At this more advanced stage:

- (1) a simple verb (v) or is + v have a 65% probability of referring to present continuous time;
- (2) is + v-ing tends to be confined to the present habitual and future time;
- (3) will, where used, always indicates futurity, but is usually used with other forms. A complete specification for its appearance would be:  
will (go) v (ing),  
with go and ing being optional but not mutually exclusive.
- (4) V + ed has a 55% probability of indicating pastness.

### Negation

The majority of the children make use of a rather similar negating device. A double input (of picture + negative) results in sentences of form:

NP<sub>subject</sub> + NEG - unit verb + NP<sub>object</sub>

The exponent of NEG may be not (58% of cases) or is not (38%):

not:     The little boy not pull hair

Tomorrow the little boy not kick

is not:

Everyday the two girls kick the boy becomes

Everyday the two girls is not kick the boy

Tomorrow the man punch the boy becomes

Tomorrow the man is not punch the boy

A few alternative exponents also occur: one can find rare examples of not to:

He's father not to slap

He not to climb up the tree

Two children used did not consistently and a third used it only with have and climb:

He did not punch the little boy

Such an example illustrates one danger in relying on spontaneously produced data, especially if those data consist of a few examples and which are analysed some time after they have been collected. The sentence appears normatively correct

and could lead an investigator to attribute rather complex syntactic knowledge of English to the subject, including knowledge of marking of past-time reference, a conventional affix-shift transformation and do support (if a T.G. analysis were being made). However, when questioned, the child insisted that the sentence had present time reference. Subsequently he produced:-

Everyday he did not climb the tree.

Once again the sentence is possibly correct, but the child insisted that it referred to "everyday-now". Later he used did not with have:-

No I have did not the pencil

It appears from these, and other examples that did not, and possibly is not, together with not to are merely more complex seeming exponents of NEG.: they do not represent any real post-auxiliary emplacement transformations as in normal English T.G., but have little more than pseudo-do/is support status.

Of the three children with more advanced verbal phrase structures, discussed earlier, one appears to use post-auxiliary NEG. emplacement quite consistently, although very idiosyncratically:

<u>declarative</u>	<u>negative</u>	<u>time reference</u>
is punch	is not punch	pr. cont.
are kicking	are did not kicking	pr. hab.
will go punch <sup>become</sup>	will go not punch	future
is climbed	did not climbed	past



It may be that this does represent the emergence of a system closer to that of normal English, resulting in the appearance of several different seeming forms all treated as roughly equivalent, but an alternative explanation may be that the processing of more than one stimulus input may overload the capacity of the child's linguistic competence, causing a regression to more primitive language rule usage.

### Interrogatives

That this sort of regression is a real possibility can be seen in the primitive rule used by all the children in this investigation to generate interrogatives. Here the declarative is treated as a unit. Where the time marker was omitted in declaratives it was inserted usually in sentence-initial position. Where T.M. is used in declaratives in final position it is moved to sentence-initial, giving a basic unit of:-

TM + S (Where S = sentence)

This is later used as a unit to which is preposed an interrogative marker, Q:-

Did (tomorrow (Ruth and Mark watched the television))

Q      TM           S

Did (before (the dog run bite the postman))

Q      TM           S

Is (tomorrow (dog bite postman))

Q      TM           S

In each case, S occurs elsewhere in test protocols. TM has either been added to S or shifted to sentence-initial position. In contrast one child shifted TM from initial to final position. Thus:-

Tomorrow Mary and John looked the television

became:

What is (Mary and John looked the television (tomorrow))

Q                      S    TM

Other children, including those with more advanced rule systems for generating declarative sentences, use similar rules. In these cases the exponent of Q may be is, why or why did:

Is (Mary gave a bone to her dog)

Q    S

Is (John and Mary will be watching the television(again))

Q    S    TM

Such examples provide clear evidence of the regressive tendency referred to above.

#### Complex and compound sentences

Although the form of elicitation of sentences was intended to obtain a relatively wide sample of mainly simple sentences, a rather small number of complex and compound sentences of various sorts were also produced.

#### Conjoined sentences

The most primitive form of conjoining sentences was by simple juxtaposition, used on occasion by all subjects, even those with the more advanced knowledge:

He climb up to tree.    Why (= ? because ? GPI) he  
want to play, He climb up to tree and fell down.

(Punctuation seems to offer little guidance in interpreting

longer utterances in this group of children).

Other children linked sentences with and, without deletion of a co-referential NP:

Two girls kick a little boy and a little boy is cry,

Others used contrastive sequences, linked by but:

Before I have a dog, but my dog has crash by car

Before the small boy's dad slap his face, but not now  
his dad not slap to him.

(In the first of these contrastively conjoined sentences can be seen the only attempt in the corpus to form a passive sentence, using by but without any auxiliary support in the verbal (cf. Power and Quigley, 1973). This child used unit verbs elsewhere, as can be seen in before I have .... Has crash is probably a form of have + NP rather than a compound past).

As stated earlier, in Chapter II, all the children produce conjoined NP's:

Yesterday Mary and John looked the television.

This was in response to an eliciting picture. One child also wrote:

The two girls kick knee and bottom boy

#### Causal clauses

One child produced several causal constructions quite spontaneously:

Father gave Charles present because he's (= his?)  
birthday.

Everyday the small boy's dad slap his face because  
he alway naughty boy.

In these examples the strategy used closely resembles that of English: deletion of the co-referential NP in the subordinate clause and replacement by an appropriate pronoun. A third example is handled less successfully:

Tomorrow two big girls will kick to him because  
a little boy been rude to two big girls.

It is possible that the lower level of success here is a result of the difficulty of handling two sets of co-referential NP's. One pair is left untreated, while in the other it is the first occurrence that is deleted, a similar strategy to that reported by other investigators. Absence of co-referential NP deletion can also be seen in:

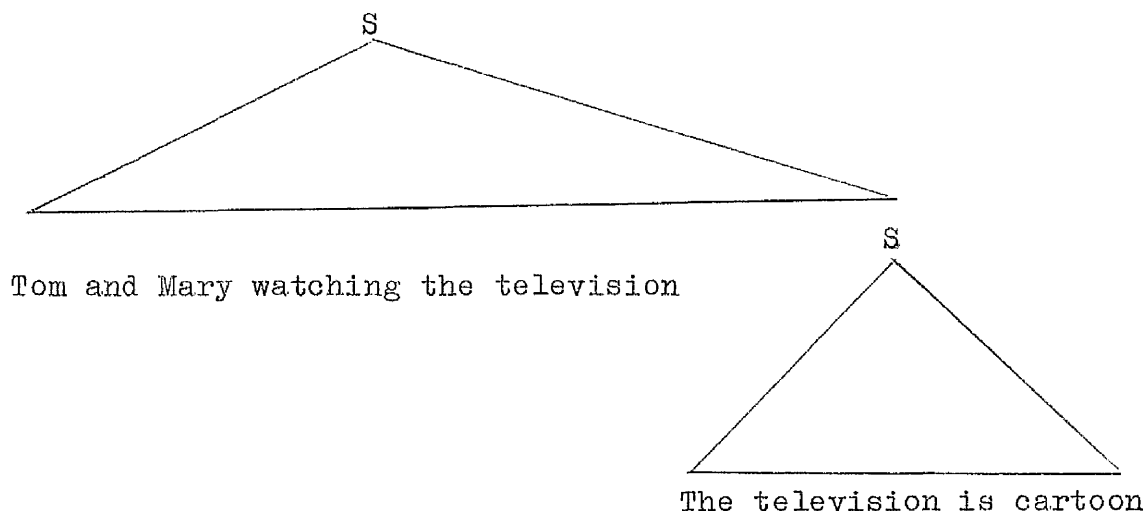
A little boy can't climb the tree because the tree  
is too high.

#### Relative clauses

Some examples of relativisation occurred. The surface forms of each were closely similar to those reported elsewhere and discussed in Chapter II:

Tom and Mary watching the television is cartoon.

It is tempting to follow the analysis of Taylor and Quigley (opera cit.), in which it is assumed that a possible deep structure may be:



with a subsequent deletion transformation to delete the second co-referential NP. There is no evidence for this analysis, which is based on a transformational analysis of English. On the evidence available it could equally be the first co-referential NP that is deleted.

Some evidence for this may be found in the tendency (seen in this research in the case of a causal clause) to delete the first of two co-referential NP's, suggesting that the final sections of complex sentences are, in some way, more salient than earlier sections. This may also explain the bizarre results of Davis' investigation (op. cit.) discussed in Chapter II. In this case, the deaf children seemed to prefer to operate on the final  $N_2-V_2-N_3$  section

of  $N_1-V_1-N_2-V_2-N_3$  sentences, even where these were meaningless.

Until this problem can be resolved it is probably wiser to avoid a transformational analysis and to preserve a neutral description in set-theoretical notation:

$$\text{where } S_1 = \left\{ \frac{\text{Tom and Mary watching the television}}{\{X \quad Y \quad Z\}} \right\}$$

$$\text{and } S_2 = \left\{ \frac{\text{The television is cartoon}}{\{Z \quad K \quad L\}} \right\}$$

$$S_1 \cup S_2 = \left\{ \frac{\text{Tom and Mary watching the television is cartoon}}{\{X \quad Y \quad Z \quad K \quad L\}} \right\}$$

A similar analysis may explain the sentence:

Daddy gave John present the box

Here it may be argued that  $S_1 = \{\text{Daddy gave John present}\}$  and  $S_2 = \{\text{present } \emptyset \text{ the box}\}$  (where copula =  $\emptyset$ , see next section).

$$S_1 \cup S_2 = \{\text{Daddy gave John present the box}\}$$

Be and have

In addition to a range of performatives, the uses of be and have were examined (Ivimey, in manuscript). This section of the elicitation process was very difficult and it was often impossible to obtain a full range of forms. Where this was possible, the common feature of unchanging unit-verb (have and are) reappeared:

present reference:	<u>you have dog</u>
	<u>we are very happy</u>
past reference:	<u>before I have dog</u>
	<u>before we are happy</u>
future reference:	<u>tomorrow they have some money</u>
	<u>tomorrow you are happy</u>

In general be and have appear rather later than performatives and it is possible to detect some stages in their emergence:

Stage 1(a): be and have usually absent:

I boy man  
You child boy

Stage 1(b): be may be used but actual forms appear to be random:

<u>I is man</u>	} All produced by one child
<u>I are very happy</u>	
<u>Now he was bad boy</u>	

<u>I are the man</u>	}	Produced by one child
<u>You are the boy</u>		
<u>We are the children</u>		

In this stage have is often replaced by be:

I am ball  
You are dog  
Tomorrow I am ball

Stage 2: At this stage the verb in the present is handled with greater confidence, although there seems to be a curious, yet consistent omission of the second person form of be:

<u>I am happy</u>	<u>I am man</u>
<u>You John</u>	<u>You big boy</u>
<u>We are children</u>	<u>We are children</u>
<u>They are girls</u>	<u>They are children</u>

(Each set was produced by a single child)

It is at this stage that unit-form usage appears:

<u>We are very happy</u>	<u>I have a ball</u>
<u>Before we are happy</u>	<u>Before I have dog</u>
<u>Tomorrow you are happy</u>	<u>Tomorrow they have some</u> <u>money</u>



In Stage 3 there is the emergence of a system of time marking internal to the verb phrase:

Tom was bad boy

Tomorrow you be good boy

The second sentence contrasts with a present-reference:

You are boy

A long time you will be man

They will not be children any more

Tomorrow you going to have a dog

They will have their icecream

You been have a dog

### Negation

Similar exponents of NEG appear with be and have as with performatives, but NEG, where it occurs, follows the verb:

I am did not mummy

They are did not three girls

I have did not a ball

I are not the ball (for have not)

Tomorrow they have no some money

Even where an auxiliary occurs, it appears to be seen as an integral part of the verb:

I been have not a ball

They will have not icecream

Only one child appears to have reached the stage of placing the negator between auxiliary and verb:

I had not play with my ball,

although, as this contrasts with the declarative:

Before you had lovely a day

it may be that had play should not be seen as an auxiliary + verb structure. Play may have non-verbal semantic features here, perhaps representing game (the two are often confused by deaf children and are represented by an identical gesture in their sign language).

One child (different from the child more advanced in use of have) uses a normatively correct NEG emplacement rule with be:

They will not be children any more

No interrogatives could be obtained in this part of the test, which is hardly surprising, given the great deal of uncertainty in handling declaratives.

## Discussion

The data obtained in the studies by Ivimey and his students and their analyses are broadly congruent with earlier work. In some respects these later analyses confirm earlier findings. In other cases they extend them while in yet others they suggest important modifications:

(1) The general sentence pattern reported by Taylor (op. cit.):

$S \longrightarrow NP + VP$

is supported. This rule appears to be well-established by the age of 10 years.

In contrast Taylor's verbless sentences:

$S \rightarrow NP + \text{locative}$

$S \rightarrow NP + \text{adjective}$

$S \rightarrow NP + VP$

found with her youngest subjects, may merely indicate the lack of understanding of be and have (resulting in lack of usage), reported by Ivimey.

(2) Jarvella and Lubinsky report;

.... the deaf subjects, and particularly the younger ones, often used no verb inflections in their descriptions. (op. cit., p.63).

The Heiders and Myklebust also comment that the written language of their deaf subjects was characterised by lack of systematic tense sequences in successive sentences. It appears that all the subjects were using unit verbs in the

sense defined by Ivimey (1976(b)): form may be that of normal English present or past but time reference is not systematically signalled by the appearance of the verb. It may be that Jarvella's youngest subjects were using unit verbs with present forms, while the older subjects used both present and past forms.

A similar explanation may explain the apparent confusions arising from use of incongruent adverbs of time and "tenses":

Tomorrow Mary and John looked the television  
Tomorrow is an external marker (external, that is, to the verbal system) of time-reference. Looked carries the major semantic information of the performative "act of looking".

(3) Prepositional usage is generally similar: prepositions are frequently omitted or may occur apparently at random. Ivimey's work has shown that what is omitted and what is included depends very greatly on the level of sophistication reached by the children and its interaction with the conceptual problems underlying different groups of prepositions.

Further understanding may be gained from the tendency of the deaf to treat some verbs and prepositions as units. The peculiar status of felldown has already been discussed. Other examples may be seen in fallover and

climb up. Kick to and slap to occur with such frequency that it is possible that they too should be considered complex verb + preposition units with general performative function.

(4) The rules for achieving negation reported by Taylor and others are similar to those derived by Ivimey. In contrast the latter's work throws additional light on question forms. Quigley et al. (1975) see in:

Who did the dog chase the boy?

a failure to apply a deletion transformation. Ivimey argues that such a sentence may more appropriately be seen (in terms of the language system of the deaf, taken as a language sui generis) as arising from the preposing of a Q-marker (Q = who did) to a sentence treated as a unit.

(5) This tendency to treat sentences as units, especially where they occur towards the end of an utterance, may also explain some of the strange findings of Davis, Taylor and Quigley et al. (opera cit.) in usage and acceptance by the deaf of relative clauses.

(6) Generally similar structures appear in the handling of conjoining problems. And is the most frequently occurring conjunction, although some examples of but are found in Ivimey's work and these are used correctly to achieve

contrastive effect. Such differences as occur, e.g. between the work of Ivimey (op. cit.) and Wilbur (et al. (1975)), appear to arise mainly from the form of the investigation.

(7) Taylor reports confusion in complement structures giving forms like: began screamed, know how to swimming. Ivimey's subjects sometimes used compound verb structures: ran jumped, run bite. It may be that these do represent complements without use of to and with some incorrect time marking. Ran jumped could be interpreted in this way, since the eliciting pictures showed a boy running towards and jumping over a stream. This explanation can not apply to run bite, however. It may be that we have here a complex of verbs with rather different semantic reference than one would expect in normal English usage. Run may indicate some form of violent activity with the specific kind of activity being shown by the second element: jump, bite. The actual form of the elements appear to derive from the form adopted by unit verbs elsewhere. Thus, swimming, in Taylor's example (i.e. know how to swimming) should not be seen as incorrect gerundial usage but a persistence of the unit-form linked with a verb-preposition complex: know how to.

A similar complex can be seen in the case of nouns:

1 boy man

You child boy

One can, however, do little more than speculate here, since the study was not designed to elicit information about the facts of a possibly deviant semantic space.

(8) The use of unit verbs, linked with a delay in appearance of non-locational and non-directional prepositions explains the difficulties reported by Tervoort, Schmitt and Power and Quigley (opera cit.) in handling passives.

From these widespread, general similarities we may conclude that the eliciting approach developed in London yields rather similar samples of language to those collected by recordings of spontaneously produced utterances. Little appears to have been gained by this alternative research methodology except, possibly, some decrease in the time needed to collect data. However, there are some definite gains in the newer approach. There is, for example, less uncertainty about semantic reference. This has been shown in the case of time and aspect in verbs, but it can also be seen in nouns. Thus:

The girl kicked the boy

may appear to be normatively correct, and would lead an investigator to assess the syntax of the writer rather highly. However, the eliciting picture showed two girls. Clearly, at this stage the form of nominal phrases may be as divorced from accurate semantic signalling as is the form of verbal phrases.

Similar form-meaning discrepancies can be seen in:

Daddy gave presents boy     (only 1 present shown)  
The girls gave bone dog     (1 girl only)  
(Ivimey, 1976a)

Just as one can, in the three most advanced subjects of Ivimey and Lachterman, see an emergence of verbal morphology from a primitive stage of unchanging unit-verb usage, where time and aspect distinctions are made, if at all, elsewhere in the sentence, so it may be that here we have a stage marked by unit-nouns, where the noun stem preserves the central semantic idea and distinctions are made externally:

three child, two girl.

Out of this grows a system of number marking "internal" to the noun. The uncertainties illustrated above reflect the emergence of this "internal" system.

Another advance gained from using the elicitation method is that the investigator need no longer rely on largely fortuitous determinants of what sorts of data will be produced. Nor need he accept only the amounts of data that occur spontaneously; he can obtain as many examples of whatever structure he needs for subsequent analysis. The structures obtained by the London workers are limited, but in principle



the method may be extended in any direction and to any lengths that an investigator wishes.

Perhaps the greatest merit of this newer approach lies in the fact that it forces the investigator to carry out his analysis in terms that are not only linguistically and systemically meaningful, but also that he may obtain enough data to be analysed as a language system sui generis. Control of semantic inputs to the syntactic encoding system enables the investigator to detect the operation of any semantic-to-sentence transformations independently of any transformational models developed for normal English.

Further, no guesses need be made about any hypothetical cognitive structures underlying the transformational or transductional processes. In cybernetic terms:

every system .... is investigated by the collection of a long protocol ..... showing the sequence of input and output states..... This form .... will represent anything from the investigation of an electrical network by putting in a sinusoidal voltage and observing the output, to a psychiatric interview at which questions  $\alpha$ , B were put and answers g, f, h, j elicited.

Thus the primary data of any investigation of a Black Box consists of a sequence of values of the vector with two components:

(input state, output state)

..... From this, there follows the fundamental deduction that all knowledge obtainable from a Black Box (of a given input and output) is such as can be obtained by re-coding the protocol; all that and nothing more.

(Ashby, op.cit., pp. 88-89 - italics in the original).

It was shown in Chapter II that not only had earlier investigators contaminated their analyses by importing unwarranted (and possibly irrelevant) transformational concepts developed to explain normal English sentences, but they had also failed to meet Chomsky's requirement for descriptive adequacy by testing the final grammar against the intuition of an ideal speaker-hearer of the language that the grammar purported to describe. The London group as attempted to meet this requirement, although without marked success (Barclay, 1975).

In Barclay's investigation a group of deaf children, most of whom participated in Ivimey and Lachterman's study, were initially taught to evaluate sets of statements as "right" or "wrong". Thereafter they were exposed to four series of sentences: normal English(E), disarranged normal English (ME), normal "Deafish" (D) based on the grammar written by Ivimey and Lachterman, and disarranged normal "Deafish" (MD). The aim of the investigation was to discover whether the deaf children would find normal "Deafish" more acceptable than other types of sentence.

The subjects showed a preference for normal English sentences, selecting them as correct about 50% of the time, with other types selected in roughly equal proportions. In this sense, the investigation failed to support a prediction based on cognitive psychology models (Neisser, 1964) of perception, that perception occurs largely in terms of the

model that the perceiver brings to the act of perceiving. The prediction was that deaf children would accept, by marking "right", Deafish sentences significantly more frequently than other types of sentence.

Barclay argued that this predictive failure was evidence against the validity of Ivimey's analysis. However, the findings are not conclusive. "Deafish" sentences used were not generated by the grammar but had various additions made to them in order to disguise their generally shorter length. Again, the "Deafish" sentences were generated from a uniform grammar, yet many children used idiosyncratic exponents of various syntactic features. In an emerging system it would probably be more useful to study the acceptability or otherwise of sentences generated by an individual's own specific grammar. Finally, through an unnoticed error in randomisation of the order of occurrence of the four types in each block, E sentences were found rather frequently in last place. It was shown that the deaf subjects had a statistically significant tendency to select the sentence occurring in last position (possibly linked to the preference for selecting and operating on the last clause in a compound sentence). Although no accurate allowance would be made for the contaminating effect of this positional preference, it is probable that the different sentences would have been acceptable in roughly equal proportions.

It is clear that this investigation was not entirely successful in testing the acceptability of the grammar through comparison with the unconsciously operating intuitive knowledge of the deaf children, yet it represents an important advance in our approach to the central problem of describing the language skills of deaf children. For the first time it has been possible to attempt to do this on the grounds of reasonably sound knowledge. The task still remains to be fulfilled.

#### CHAPTER IV

#### Competence, reliability and validity: an epistemological justification of the elicitation method

The analysis of data discussed in Chapter III shows that at least the children studied by Ivimey and his students have acquired and utilise a system of rules in the production and understanding of utterances. This would seem to be strong evidence for the assertion that these children have a functional linguistic competence. This assertion contradicts Furth's frequently repeated belief that

the vast majority of persons born deaf do not acquire functional language competence. (op. cit.)

It may be, of course, that the London workers hit, by accident, on a sample of the minority of the deaf who have acquired functional language competence and that Furth was referring to the rest. This raises problems of extrapolating to a larger population interpretations derived from data obtained on a sample of that population. The greater part of this chapter will be devoted to this question, but before examining it we must first consider the epistemological status of the term "competence".

It appears that Furth was making two distinct but related errors in his use of the term: confusing competence and performance on the one hand and standard English and an unknown language on the other. To take the latter case

first it is clear that to equate poor knowledge and use of English with a lack of competence in language is to condemn the largest part of the human race to a state of a-lingualism. Stated thus the argument fails at once, yet Furth neglected to examine whether his subjects may have been utilising some form of syntactic-symbolic coding different from that of normal English. He does mention the possible existence of some form of kinaesthetic/muscular coding based on sign language but does not regard this as a true language. In spite of it, he says, "a deaf child is a human being without language" (see Introduction).

Close inspection of Furth's use of the term "competence" shows that he is, in fact, using it in an idiosyncratic and unusual manner. One need not accept all, or indeed any, of the current T.G. orthodoxies to realise that the distinction ( powerfully developed by Chomsky<sup>x</sup>) between competence and performance is valuable. However it seems that Furth's

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The distinction was first noted by the behaviourist psychologist Tolman in his researches into the learning by rats of routes through complex mazes. Animals allowed pre-test unreinforced experience of the mazes subsequently performed during reinforced tests at a much higher and statistically significant level than rats without this experience. It was held that the experienced rats had, during their unreinforced explorations, constructed "cognitive maps" of the mazes which they later utilized in test situations. Tolman accepted that true learning involved the construction of these cognitive maps, later called competence, in contrast to reinforcement which altered the characteristics of performance only. (Tolman, 1948).

"competence" is closer to Chomsky's "performance"; the performance of deaf children in English is bad, therefore their linguistic competence is bad or non-existent.

Chomsky characterised competence as:

the most neutral possible (description of) the knowledge of language that provides the basis for the actual use of language by a speaker-hearer. (Chomsky, 1965, p. 9).

Chomsky's use of the term is confused and imprecise, but it is clear that he equates linguistic competence with some hypothesized mental structures:

Such facts ..... support the hypothesis that deep structures of the sort postulated in transformational -generative grammar are real mental structures. (Chomsky, 1972, p. 107).

These mental structures are conceived as isomorphic with T.G. phrase-markers and transformational rules, which not only guide sentence-construction but also influence language perception:

In general we cannot understand any sentence fully unless we know at least how it is analyzed on all levels as phrase structure and .... transformational structure. (Chomsky, 1954, p. 87).

Thus for Chomsky competence is a hypothetical construct of great use in understanding the problem of communication. But there are, he believes, many differences between competence and the actual utterances generated by it: performance. This latter is marked by epistemologically insignificant linguistic parapraxes: slips of the tongue, temporary short-term amnesias, changes of cognitive direction while speaking, and so on.

While there is some value in this distinction between performance and competence, in the hands of orthodox transformationalists it can become counter-productive, especially in a study of the language development and knowledge of unsophisticated groups such as young children, the handicapped and even many adults. Competence is an ideal speaker-hearer's grammatical knowledge. This is intrinsic and cannot be directly observed. What can be directly observed, i.e. performance data, may not give much direct or valuable insight into this competence:

Observed use of language ..... may provide evidence as to the nature of ..... mental reality, but surely cannot constitute the actual subject matter of linguistics. (Chomsky, 1964(a), p. 4).

Stated in this way no exception can be taken to the assertion: in any intellectual enterprise the ground rules of the processes to be utilised may be postulated initially. Thereafter they must be judged only on the basis of the insights that derive from their application and the consistency with which



they are applied. However, Chomsky goes further than this: in one seminal paper (Miller and Ervin, 1964) doubts were cast on some aspects of Chomsky's model of language development. These doubts were based on observed use of language by children. The first discussant of this paper was Chomsky who rejected the evidence outright:

Direct description of the child's actual verbal output is no more likely to provide an account of the real underlying competence in the case of child language than in the case of adult language ..... Not that one shouldn't start here, perhaps, but surely one shouldn't end here or take too seriously the results obtained by one or another sort of manipulation of data of tests produced under normal conditions. (Chomsky, 1964(b), p. 36, italics supplied).

Thus, by removing his model from any possibility of direct testing by external data, Chomsky has fallen into the anti-empirical trap described by Kant:

Besides, once we are outside the circle of experience, we can be sure of not being contradicted by experience. The charm of extending our knowledge is so great that nothing short of encountering a direct contradiction can suffice to arrest us in our course; and this can be avoided, if we are careful in our fabrications - which none the less will still remain fabrications. (Kant, 1787, trans Smith, 1970, p. 46).

In contrast to Kant, the criterion of any analysis depends, in Chomsky's view, on achieving a close match between analysis and the intuitions of an actual native speaker.

It is important to bear in mind that when an operational procedure is proposed it must be tested for adequacy ..... by measuring it against the standard provided by the tacit knowledge that it attempts to specify and describe. Thus a proposed operational list ..... must meet the empirical condition of conforming, in a mass of crucial and clear cases, to the linguistic intuition of the native speaker.

(Chomsky, 1965, p.19, italics supplied)

However it is difficult to see how such an operational test can be carried out in the case of young children or of a handicapped group like the deaf who are cognitively and linguistically too unsophisticated to provide veridical reports on their intuitions (if, indeed, they are able to intuit at all beyond a very low level of sensori-motor or concrete imagery). Thus any investigator of the language use and competence of these groups must either abandon his research on the grounds that there is no adequate empirical test that can confirm or destroy his analyses or he must fall back on his own adult intuitions about the subjects' competence. Since any empirical data that may threaten an accepted model need not, in Chomsky's opinion, be taken too seriously there can be no external and independent validation of any resultant analysis. In the light of this the use of the term real as applied to the nature of competence is meaningless: it serves merely to defend one model of linguistic competence from potential empirically based attacks. Clearly no scientific enterprise can depend upon ex cathedra pronouncements as to the admissability of evidence by any

practitioner, however eminent.

The greater part of recent work on the language skills of deaf children carried out within a T.B. framework, discussed in Chapter II, reveals this fatal flaw: that of analysing one unknown language (that of the deaf) in terms of hypothesised structures and transformations relevant to another (that of adult Americans). For the most part this has been unconscious, but in contrast, as we have shown, Morehead's report of an investigation into the language skills of a group of handicapped children reveals a very conscious example of the dangers. (Morehead and Ingram, op. cit.) This criticism is not trivial. One of the major conclusions of Morehead and Ingram, of Taylor, Ivimey (opera citata) as well as of Menyuk and Looney (1972 (a) ), describing the language competence of language-disordered children is that the deaf and other handicapped groups studied do not differ linguistically in kind from that of normal English speaking children: their linguistic competence is essentially English but exhibiting a massive delay in development. This may well be true but since the analysis has been carried out with the more or less tacit assumption that the deep structures and transformations are similar or identical to those of English the conclusion is hardly surprising. The actual surface forms of many "deaf" sentences appear to resemble rather closely those found in elementary introductions, e.g., to Chinese (Fenn and Tewkesbury, 1967) or Malay (King, 1964). It may be that, if an analysis were

carried out with assumptions based on Chinese or Malay deep structures then it could be shown that North American and English deaf children were in some sense actually using Chinese or Malay deep structures! Such a conclusion would probably be extreme, but it has not been considered, let alone examined. In the absence of an analysis in terms of a wide range of possible language structures no such conclusion is really acceptable. The apparent rigour of a transformationalist approach is little more than a convenient mask for the operation of a number of intellectual and linguistic prejudices. Far worse, it may blind investigators to some potentially useful lines of investigation. Ivimey (1977(c)) has shown that there are many similarities between the language of deaf children, among others, and INTERLANGUAGE, a developmental stage detectable in the process of acquiring English under a wide range of conditions, postulated by Selinker (1972; reprinted in Richards, 1974). The potential value of this concept is twofold: (a) it relocates language acquisition in a learning framework, thus enabling linguists to examine realistically the causes of deviant or delayed language development and to investigate possible remedial techniques; (b) if the acquisition stages of other languages show similarities to those of INTERLANGUAGE, then it may be that an empirically (as opposed to speculatively) based language universal will have been discovered.

A more serious criticism of the research within the T.G. framework is one that even Chomsky fails to recognise.

His ideal grammar is one that is couched "in the most neutral terms" (1965, p. 9) and, as has been shown, he sees such a description as involving phrase-markers and transformational rules. Such hypothetical constructs are in no sense of the term neutral. Many eminent linguists offer alternative categorisations of the structure of linguistic competence and even within the T.G. field there is conflict and disagreement. Since the validity of each of these competing models has, presumably, been tested against its author's linguistic intuitions, they must in some sense all be acceptable. But we have no *universally acceptable* criterion in terms of which we may assess the adequacy of any model as compared with that of alternative models and it is premature to categorise only one as the most neutral.

In order to avoid fruitless doctrinal and largely scholastic disputes the writer accepts Boas' definition of grammar as heuristically the more neutral:

a system of empirically decidable statements about language structure.

(Boas, 1963 , p. vii)x

This definition focuses ~~our~~ attention on language, as opposed to cognitive structure and thus avoids any necessity of guessing, possibly inaccurately, and certainly without any empirical check on the veridicality of our guesses, about

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x In this he ~~parallels~~ Popper: "Science is not a system of concepts but rather a system of statements" (Popper, 1971, p. 35).

a hypothesized interface between cognition and language. Observed data must be analysed as a whole: what may appear, in terms of the observer's linguistic intuitions, to be a parapraxis must not be either ignored or corrected unless very strong evidence for its incorrectness is available. The original form together with a clear statement of any other evidence should be given so that subsequent investigators may reach their own independent conclusions about the acceptability of the interpretation in question. In this way we satisfy Kant's criteria for scientific thinking:-

Upon such synthetic, that is, ampliative principles, all our a priori speculative knowledge must ultimately rest; analytic judgments are very important, and indeed necessary, but only for obtaining that clearness in the concepts which is requisite for such a sure and wide synthesis as will lead to a genuinely new addition to all previous knowledge.

(Kant, op. cit., p. 51)

Here synthetic or ampliative principles are those derived from experience, while a priori speculative knowledge and analytic judgments represent "pure reason". This may be applied to empirical knowledge in order to clarify our concepts but can never replace it. Experience is logically and necessarily prior to introspection and intuition.

Other key points involved in Boas' definition are (1) that we must concentrate on systemic, that is relational analyses;

Language is "a system of objects that is objects among which certain relations are established".

(ibid.)

and (2) that any statements made about these systems must be empirically testable.

A grammar or set of statements describing regularities (at a high level of abstractness) detectable in linguistic performance can in no way be conceived as an isomorphically real model of some aspects of human cognition. It is inevitable that any investigator will bring to his work certain assumptions about the processes and structure of cognitive activity and these will guide him as to what appear to be fruitful lines of research or strategies for prosecuting these<sup>x</sup>, but the results of his investigation cannot throw direct light on the original assumptions without circularity of reasoning. The model can be supported or falsified only through the testing of predictions from the original model to totally new situations, and it will continue to have value only so long as predictions are supported.

It may be that human cognition is organised in form similar to our statements about or descriptions of one or other aspect of human behaviour, but research into linguistics can surely not throw any very clear light on this

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x See appendix (a)

problem. A solution will come, if it comes at all, from detailed research on the one hand into cognition and on the other into language structure and usage. Subsequently it may be possible to isolate and describe processes occurring at the cognition/language interface. At present the basic knowledge and techniques for doing this do not exist and it is highly likely that premature attempts to pre-empt the field on the basis of partial (and possibly incorrect) models may delay any possible solution. It is the view of the writer that, at this stage of the development of cognitive linguistics as a science attention to the construction of empirically valid and reliable models of language behaviour are likely to be more fruitful, and it is to this problem that we now turn.

#### Empiricism and the study of language

Boas advanced as a test of any proposed grammar that it must be empirically "decidable". He does not define this term, but the context in which it appeared implies the application of some publicly available and recognised form of testing. We have seen that for Chomsky the ultimate test of a model is against its author's intuitions; and where actual data conflict with the model they may be rejected. The model is, in his case, epistemologically prior to evidence. In contrast, for Popper (1971, p. 41), any empirically based scientific system must be, at least in principle, refutable



by experience. This difference is crucial; for the transformationalist empirical testing of his proposed analysis frequently seems to involve a reduction to the process of searching through his privately accessible intuitions for a single confirming instance. This is thenceforward accepted as empirical proof of the veridicality of the analysis in question. Counter examples are treated as elements of an error-category (parapraxis), placed on one side for subsequent examination, or may simply be ignored. In contrast the scientist's approach involves searching, in some publicly accessible manner, for a single disconfirming instance, whereupon the model in question must be re-examined, will certainly be reformulated and may be rejected. For Popper a statement is:

empirical or scientific only if it is capable of being tested by experience. These considerations suggest that not the verifiability but the falsifiability of a system is to be taken as a criterion.

(ibid, p. 40)

In order to achieve this desired aim of falsifiability "it must be possible for an empirical scientific system to be refuted by experience" (ibid., p. 41). Thus, if any grammar is to be considered as a scientific statement, not only must it meet the full requirements of any other scientific statement (viz. - it must be parsimonious in the assumptions it makes, it must be internally coherent and it

must cover a wide sample of whatever experiences it is attempting to integrate) but it must also be expressed in such a way that from it may be made deductions about the expected nature of data or experiences not included within its original domain. This cannon entails two further implications: (1) it is not the reality underlying a theory that is tested but statements about that reality:

Science is not a system of concepts but rather a system of statements.

(Popper, op.cit., p. 35).

These statements are

General laws covering the behaviour of the empirical events or objects with which the science in question is concerned.

(Braithwaite, 1968, p. 1).

For Braithwaite these laws reduce to a fundamentally simple proposition: a scientific law

always includes a generalisation, i.e. a proposition asserting a universal connexion between properties. It always includes a proposition stating that every event or thing of a certain sort either has a certain property or stands in relation to other events or things, having certain properties.

(ibid. p. 9).

(2) such generalisations are inevitably based on only limited or partial experience.

In the light of this second implication the testing of any scientific thing or set of laws becomes that of examining the range of applicability of this theory. The scientist begins with a set of observations or measurements made on a limited sample of objects. On the basis of this limited and partial experience he makes a generalisation that will have wide, hopefully universal, application: the wider the domain of applicability the greater will be the veridicality or truth value (in terms of current knowledge and epistemology) of his generalisation. Thereafter, empirical research becomes a process of testing the theory against an increasingly wide and varied sample of data or experiences, usually in terms of some widely accepted research paradigm (Kuhn, 1962). If as a result, the generalisation can be shown to be both "true" and of wide application, then it is accepted as provisionally adequate. Any failure to meet these criteria will label it false and inadequate or, at best, partial. Such a disconfirming experience will entail more or less extensive revision (up to and including rejection) of the generalisation. The aim of scientific research is thus

not to save the lives of untenable systems but, on the contrary, to select the one which is by comparison the fittest by exposing them all to the fiercest struggle for survival.

(Popper, op. cit., p.42).

If linguistic statements are to be accepted as scientific theories, then the problem of assessing such statements must be located within the more general problem of assessing the veridicality and scope of any statement and more specifically of any scientific statement concerning human behaviour.

In an idealised situation an observer or experimenter concerned with some aspect of human behaviour would, before attempting to make an analysis, collect and record in a publicly accessible and reproducible form every possible behaviour sequence, utterance or other fact relevant to his interest. Such a process is clearly impossible: one would need half the world observing and being observed by the other half for a whole lifetime before any statement aiming at generality of universality could be attempted. Such a process is clearly impossible: apart from economic obstacles, very little of value would be gained by waiting until one's subject had died (lest any future behaviour were to contradict an earlier analysis of his behaviour systems). "Call no man happy until he be dead" may have been the mark of prudence under the late Roman emperors: as a research heuristic it contains apparent flaws.

Instead, the researcher must collect only a sample of relevant behaviours and, by a process of induction, extrapolate the characteristics of this sample to those of some

superordinate population. In general sample and population have their normal statistical meanings relating to more or less inclusive sets of subjects but in the case of language a sample of utterances is taken from the potentially infinite total population of possible utterances. We have seen that in much of the earlier research limited measurements of some rather superficial aspects of language in use have been made on more or less large samples of subjects under the belief that only in this way would the resultant analysis be truly scientific. But this is not necessarily so; a study of a large sample of utterances (taken from the population of utterances possible during his lifetime or over a more limited period) of a single subject may be equally scientific. The question reduces to this: whether greater insight into, say, French as a language is likely to be gained by measuring the mean lengths of utterance or type-token ratios of a thousand, or even of several thousand Frenchmen or by studying intensively and over a limited period of time the patterns incorporated within the utterances of a single Frenchman.

What is certain is that, for example, French babies, each exposed to the utterances of a very restricted number of speakers over a period of  $\frac{1}{25}$  -  $\frac{1}{15}$  of the average human lifespan, gain sufficient insight into the characteristics of the total population of possible French utterances as to enable them to produce sentences that would be regarded as acceptable to any normal French speaker.

We may assume therefore that what appears to be a viable heuristic for the baby attempting to master his parents' language is likely to be no less valuable for a scientist studying that baby's own attempts at using language. This point is widely accepted by linguists studying unknown languages: it seems to have been forgotten by many investigators studying the equally unknown languages of young children and of the handicapped. However, this process raises one major problem: just as, on occasions, a baby may extrapolate wrongly from his limited-base model, so may the linguist. When he is studying a language used by adults his mistakes are likely to be soon corrected, leading to more accurate formulations, but this is unlikely to occur when child-language is being investigated, and, as stated earlier, it is difficult to see how it could be achieved. Thus, investigators in these fields face a very difficult problem - of testing the validity and reliability of their analyses in the absence of any possibility of direct testing and falsification of the analyses in question. Thus any error made by the informant or by the observer in recording and analysing his data will cause the descriptive model based on the sample to differ from that based on the population: the descriptive grammar will be to that degree less accurate than it should, or could, have been.

This problem is not unique to the discipline of linguistics but has, for many decades, concerned professional psychologists and has given rise to a great deal of research

and theorising, as a result of which there has been developed a number of standardised and sophisticated statistical techniques that may, on the one hand counter any systematic error-factors that may have crept in during the sampling process, while on the other, enabling the researcher to make a relatively unbiased estimate of the characteristics or parameters of the population from those of the sample. For the proper application of these statistical methods some form of quantification of data is essential, and it is this requirement that leads most psychologists to collect only those sorts of data which are susceptible of quantification. Since this is impossible, beyond a very low level, in the analysis of language systems as systems<sup>x</sup>, it may seem that the linguist can look for little help from the statistician. This is far from the case: the linguist, working on a corpus of data collected over a short time from a limited number of informants must still face the central problems: how representative is his sample; how true and accurate is his analysis? Does his categorisation of his subjects' linguistic competence match their actual linguistic competence and if not, then to what degree will confidence in his analysis be misplaced?

In fact the statistician's concepts of reliability, validity and representativeness of sample are of the greatest value here. The analysis must be accepted or rejected on

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x But see Appendix A.

grounds of logical consistency, extent of applicability and so on. What can be examined is the degree with which the sample reflects the population from which it is taken, and it is to this that the statistical concepts may usefully be applied.

Reliability is essentially an estimate of consistency between sample and population or between successive samples taken from the same population. A test or eliciting-instrument as used by Ivimey should, if applied to the same subjects, on successive occasions, result in identical or closely similar responses. That is, responses to identical stimuli should be consistent between earlier and later trials, presentations or whatever. Such a process, of applying the same stimuli to a group of subjects on successive occasions may introduce its own problems;

Questions may be raised about the appropriateness of this concept .... in the measurement of psychological quantities. Clearly, in the measurement of human behaviour, the making of a large number of repeated observations is usually not possible. The attribute being measured may fluctuate or change markedly with time, or the process of repeated measurement may modify the attribute under study ..... Quite apart from the labor involved in such estimation, the results obtained would be invalidated by practise, fatigue and other effects.

(Ferguson, 1959, p. 363).

In spite of the very real difficulties outlined by Ferguson the test-retest procedure remains one of the most valuable estimators of the reliability of psychological



instruments. In addition other techniques have been developed for use where, for whatever reason, repeated administration of the same test is not possible (Stanley, 1971). Repetition of the same test after only a short passage of time may result in contamination of scores on the second occasion by memories of what happened on the first, and give a spuriously high correlation or estimate of reliability. This has led to the development of parallel forms of the test instrument that are tested on the original standardising population. Care is needed to ensure that content and format of the parallel tests are neither so different as to lead to totally different responses and an underestimate of reliability, nor so similar in specific details that reliability would be overestimated as a result of inherent variance or communality of the sampling content.

A third possibility is to use the split-half technique: responses to a single test are split, usually at random, into two groups of items. Responses within each group are checked for similarity with those in the other and a high degree of similarity or correlation is taken that the test as a whole is reliable. There are some serious problems involved in this reasoning and this technique is usually confined to situations where time, expense and accessibility of subjects are of overriding importance.

Where measurements are quantified these various estimates of reliability are usually, in principle, easy to

carry out using well-documented statistical tests. However, another problem may be less easily solvable:

Reliability is a matter of the adequacy of the sampling of items as well as the consistency of the behaviour of each individual. (Stanley, op. cit., p.407).

Such a problem cannot be solved by any statistical test; it depends very much on the sensitivity of the test designer and his assessment of various probabilities. Initially this may involve a great deal of guesswork about the behaviour in question. Thus if "intelligent" behaviour is held to include a tenacious memory, ability rapidly to solve spatial problems, verbally expressed knowledge of common features of the cultural environment, etc., then tests of intelligence will include, among others, sub-tests concerned with short-term memory, spatial problems and tests of verbal knowledge. These may be carried out against time limits so that a rapid success scores more highly than one arrived at after a longer period, possibly involving trial-and-error as opposed to systematic strategies of approach: The imposition of time penalties also involves an element of guesswork on the part of the test designer.

Such a test may enable an examiner to make certain predictions: subject X scores highly, thus has high intelligence and will, other things being equal, do well in some socio-economic enterprises. In contrast subject Y's score

indicated such low intelligence that he should on no account be allowed or encouraged to attempt any but the more repetitive of jobs under close supervision. If these predictions are confirmed in a large number of cases then it is assumed that the skills tapped in the test are a sub-set of those necessary for vocational success and the test provides a valid estimate of these skills: one need not observe the total life-behaviour of an individual before reaching crucial decisions about his ability. Instead a relatively short and cheap test may provide valid and useful information:

Narrowly considered, validation is the process of examining the accuracy of a specific prediction or inference made from a test score.  
(Cronbach, 1971, p.443)

Whereas reliability indicates the consistency of a test instrument from one situation to another, validity indicates what the test actually measures. The lowest estimate of validity is face-validity: a test may purport to examine linguistic ability by securing responses to test-sentences, as in the North Western Syntax Screening Test (Lee, 1966, 1971 ); or, like the Illinois Test of Psycholinguistic abilities (I.T.P.A.), it may examine some skills hypothesized as underlying language usage. In this case, the true validity of the test may depend very much on the test-marker's guesses as to what cognitive and other skills are involved in language use; it may grow out of a body of theories (e.g. of Behaviourism in the case of I.T.P.A.) or it may reflect current and widely held assumptions in the field.

The dangers of face validation are many and obvious: thus I.T.P.A. may be used because it contains the word Psycholinguistics in its title and because its authors, Kirk et al. ( 1968 ) are eminent within their field. The busy researcher, working within strict time and financial constraints may have neither the training nor the opportunity to discover the test's shortcomings. Instead language ability may be defined operationally as the level of score achieved on the test. If the skills involved in the test and in daily use of natural language are identical or closely similar, such a procedure may not be too dangerous, but if the theory (i.e. behaviourism) and the test-construction processes (involving jettisoning theoretically desirable sub-tests on the grounds of difficulty, cost or impracticability of application) come to sample either a distorted or, at best, only partial sub-set of pseudo-linguistic behaviours, then the findings may have very little actual real validity. A very obvious example of face validation can be found in research on dyslexia, where linguistic ability has often been taken as a set of scores on the "verbal" part of Wechsler intelligence tests for adults (W.A.I.S.) and children (W.I.S.C.) (Warrington, 1967; Kingsbourne and Warrington, 1963; Ingram, 1960; Rawson, 1968 and many others). Evidence of linguistic delay was taken from low verbal scores, and this evidence was matched with poorly validated, often unreliable and sometimes impressionistic clinical notes on language functioning. In no case was "hard" linguistic evidence offered. The Wechsler verbal tests do

not test verbal ability but certain intellectual skills expressed verbally. The distinction appears crucial yet has been overlooked by many investigators: the word verbal only appears to have justified the use of the test.

Because of the uncertainties involved in face validation, other estimates of validity have been developed. One of these is criterion-related validation: scores on a test, or predictions made from them are compared with an independent criterion, assumed to provide a direct estimate of the characteristic or behaviour in question. This criterion is often based on first-hand acquaintance by parents and teachers or clinicians, for example, of the behaviour being studied. This acquaintanceship will have typically been made over a more or less long period of time and criterion-based validation clearly involves comparing predictions based on a short-term test against wider life-experience.

Other estimates of validity may be made in terms of existing theories (construct-validity), by determining the extent to which certain explanatory concepts are held to account for performance on the test (Cronbach, op. cit., p. 13), - this could justify use, for example, of I.T.P.A., so long as the user is aware of the test's theoretical basis. - or through evaluating how well the content of the test samples the class of situations or subject matter about which conclusions are to be drawn (content validity). Construct and content validity are very close conceptually, to reliability

as discussed above: in all cases assumptions are made about the adequacy of the sampling process:

A representative sample is one that re-presents the universe, that is, one that duplicates the essential characteristics of the universe in their proper proportion and balance.

(Lennon, 1956, p. 301)

Now, although estimates of reliability and validity depend largely on the statistical treatment of quantified measurements it is clear that the concepts are of great importance for the linguist who must, inevitably work on a limited sample of data. He must assume that this limited sample is representative, in Lennon's use of the term, of the universe or population, expressible in set theoretical terms as the power set of all utterances produced or producible by some speaker or speakers. Thus his sample,  $S$ , must form a subset of the total possible language behaviour  $P(S)$  of his subjects:

$$S \subseteq P(S)$$

This condition is necessary but not sufficient, since, for example, a sample of all declarative, affirmative sentences or one consisting of negative passive sentences with future time reference and plural objects, would both satisfy the condition. What is needed is an attempt to hypothesize the probable internal structure of an abstract space,  $Z$ , such that

$$Z \equiv \sum_{i=1}^n S_i$$

(= the sum of all possible sentence-structures represented behaviourally by  $P(S)$ , i.e.,

$$Z \mapsto P(s)$$

(= Z maps directly on to P(S)).

Where  $S_1, S_2, S_3 \dots\dots\dots S_n$  are elements of Z, then s is not only a subset of P(S) but must itself contain  $S_1, S_2, S_3 \dots\dots S_n$  as elements.

In the case of an unknown language or one that has not hitherto been adequately described, such a process involves considerable guesswork.

In the greatest part of linguistic research that relies on collecting spontaneously produced data this point has not received adequate attention. Workers hope that, given sufficient time, their informants will produce samples of  $S_1$ , i.e. every possible form of sentence-structure. Samples may be collected at different times and in different situations in order to maximise the probability of achieving this desired end. However, as discussed earlier, problems arise of interpreting the absence of one possible element,  $S_j$ , or of correctly assessing the structure and functions of an element that occurs only once or twice in the total corpus. In this case the investigator, especially if he is studying a language apparently similar to his own, may equate the missing elements in the sample corpus with actual elements in his own language corpus, surmising that they are "there" potentially but that the situations sampled did not call for their use:

where  $K_1, K_2, K_3, \dots, K_n$  ( $K_i \in P(S)_{\text{sample}}$ )

occur and seem to be in one-one correspondence with  $g_1, g_2, g_3, \dots, g_n$  ( $g_j \in P(S)_{\text{investigator}}$ ) then  $g_{n+1}$  is assumed to be represented by  $k_{n+1}$  even when  $k_{n+1}$  does not occur in the obtained sample.

An example of this can be seen readily and commonly in the case of deaf children. A child may produce a sentence with verb in past form, or indeed a series of such sentences:

On Friday I went home

I saw Mummy and Daddy

I watched television

(This sequence may contain verbs with "wrong" tense form:

It is exciting is Tom and Jerry)

These extracts, taken from a deaf child's Diary appear, for the most part, formally accurate: the time reference of the incidents recounted is past and the verbs are mainly in past form:

$k_{\text{past}} \equiv g_{\text{past}}$

(again, where  $k \in P(S)_{\text{sample}}$  and  $g \in P(S)_{\text{investigator}}$ )



It is natural to assume that since the child uses apparently correctly past tenses of verbs, he could if necessary also use present and future forms, although possibly with a greater or smaller proportion of errors, i.e. since  $k_{\text{past}}$  is equivalent to  $g_{\text{past}}$ , so  $g_{\text{present}}$  and  $g_{\text{future}}$  are equivalent to  $x_{k_{\text{present}}}$  and  $x_{k_{\text{future}}}$ . Such a procedure may lead to a gross overestimate of the child's linguistic system. More seriously, it prevents the consideration of the possibility that apparent equivalence of form in the two samples may not represent equivalence of reference; i.e.:

$$k_{\text{past}} \neq g_{\text{past}}$$

leading to a new formulation of the emergence of a new and different morphological system in the sample.

A proper sampling procedure must ensure that as many elements of  $P(S)_{\text{child}}$  as seem probable are obtained in quantities sufficient for patterns to be detected. This will inevitably involve guesswork with the danger that the investigator will take samples only of those structures that are elements in his own language system. This cannot be avoided, but it seems a priori reasonable to assume that any attempt at communication will involve the making of assertions, negating them and asking questions, while some distinction of time and aspect reference, number marking and transference of goods from one person to another in different

locations and at varying times appear to be essential components of any hypothesized Z. Subsequent research may indicate alternative or complementary structures but for an initial investigation the elements listed above must be sampled both separately and in varying combinations and numbers for patterns of interrelations to be detectable.

The elicitation technique used by Ivimey and his students has attempted to take these diverse points into consideration:-

(1) the analysis is clearly one of performance. Since there is no direct access to the subjects' competence and since, if there were, there is no independent means of validating any description of this competence, it seems unnecessary to introduce it at any other than a low level of generality, viz. that, since the children use structured and regularly patterned language they must be utilising a number of rules and that these rules appear to have been based on experience of and exposure to language (Ivimey, 1976(a)). However, as shown in Appendix A, it is possible to conceive of linguistic competence as a hypothetical abstract mental structure that accepts duplex strings of (probably) unordered semantic information and converts it into regularly ordered potential utterances. This hypothetical mental structure or L.P.S. (language producing system) may be in different individuals or groups, more or less efficient at transmitting finer semantic details and attempts at assessing relative

levels of language development will focus on the fineness of detail that different L.P.S. can process. However this hypothetical construct, which may loosely be equated with competence, is at present little more than a subject for speculation. Since a hypothesized L.P.S. has been responsible for the development of the elicitation method, data yielded by the latter cannot provide any direct evidence for the existence of the L.P.S.;

(2) since the analysis consists of a set of statements about regularities characterising the language of deaf children, these statements can be independently checked and either confirmed or falsified, using identical or similar methods;

(3) the elicitation method enables any investigator to study not only the structures described by the London group but to investigate, in principle, any other structure that <sup>eliciting</sup> interests him, although/some structures would undoubtedly make great demands on the investigator's ingenuity;

(4) the elicitation method allows the investigator to acquire as many examples of different structures in as many different combinations as he needs;

(5) since each utterance is treated as a unit there is, in general, no problem of delimiting the actual boundaries of sentences. The method as used by Ivimey calls for mainly

simple sentences, but some children, especially the older ones, spontaneously produced more complex structures and the method is susceptible, in principle, of extension to compound and conjoined utterances;

(6) the elicitation method enables the investigator to be absolutely clear not only about the reference of lexical items but also of time, aspect, number and so on. Thus an apparently correct sentence:

The boy kicked the girl

may come to be seen as wrong, in terms of normal English, when the investigator knows that the time reference was future and the object plural.

(7) since the elicitation method involves the presentation of a standard set of stimulus pictures, its reliability can be tested by re-presentation of the pictures after any desired period. Moreover, reliability testing of the split-half type is an integral part of the method, since without consistency between the various items no grammar could be written at all. Conversely, a grammar that aims at describing regularities in performance implies consistency in performance.

These consistencies may be detected within a single protocol, indicating the existence of an idelect, and within a number of protocols, providing evidence for the existence of a group dialect. Within this latter the degree of consis-

tency provides an estimate of the level of confidence that may be placed in the analysis. Thus in Ivimey and Lachterman's paper, the existence of unit verbs appears to be better founded than of specific question-forming structures, since there is greater variability in the latter than the former;

(8) the elicitation method gives, of itself, no evidence of its validity but this can be obtained indirectly and will be discussed in Chapter VII. However, since the method is explicitly one of performance a number of possible validating techniques are available:

- (a) direct comparison of elicited with spontaneous utterances;
- (b) direct comparison with utterances collected by other investigators, utilising various different measures;
- (c) experienced teachers and others may use the rules of the grammar to generate new sentences for comparison with the sentences produced by their pupils. Any agreement will validate the analysis;
- (d) Lachterman (op. cit.) administered the test to a number of normally hearing children, obtaining a wide range of different number, time, aspect and other responses, all within the range of normal

English. These contrast with the data obtained from deaf children and suggests that the method does not constrain nor distort too seriously the performance of subjects.

S E C T I O N   T H R E E

The Current Research

An Analysis of the Written  
Language

## CHAPTER V

### Design of the Investigation

It has been argued in Chapter IV that the elicitation method of obtaining corpora of linguistic data used by Ivimey and his students satisfies several important, but usually neglected, theoretical requisites. Using it, Ivimey has shown that the written utterances of at least a small number of young English severely/profoundly deaf children can be shown to be neither random concatenations nor loose sequences of English words, but appear to form a system characterised by regular and ordered structures. From this evidence Ivimey deduced that his subjects possessed linguistic competence in the sense that they had access to sets of rules used productively to generate novel utterances.

However this conclusion raises a number of substantial and methodological problems:

1. It may be that the authorities quoted earlier to the effect that deaf children cannot or do not acquire functional linguistic competence were referring to the majority of profoundly deaf children. That is, it is possible that Ivimey and Lachterman hit, by chance, on that very small minority of deaf children who have acquired some (albeit deviant) competence in language. It is probable that most linguists accept the existence of a language system in deaf children, yet most of the research has been carried out by



psychologists who still, in many cases, accept the views of Furth expressed in "Thinking Without Language" and several subsequent papers and books. Those linguists who have studied the language of the deaf have done so under the assumption that it does reveal systemic elements (often taken to be closely related to those of normal English). It has been argued above that such an approach entails the possibility of tautologous reasoning and error, through superimposition of a system on what may not actually be regularly ordered.

2. Alternatively it may be that the regularities detected by Ivimey arise from powerful artefactual constraints inherent in the method used to elicit the language samples. This point reduces to the pair of alternatives: is the elicited language corpus a valid sample of the subject's true linguistic competence, or is it merely an artificially structured phenomenon?

3. If it can be shown that the elicited language is a valid sample of a larger domain of linguistic competence (represented by the totality of all utterances produced by deaf children) then it must be shown that it is also representative. For a sample to be valid not only must it form a subset of the total possible utterances, but, as discussed earlier it must represent fully the structure of the population domain from which it is taken. It may be that the elicited corpus is valid but is as stylistically limited as,

say, a formal acceptance of an invitation to a formal Dinner.

These three problems are concerned essentially with the validity of the eliciting and sampling method used in any investigation and part of the present investigation (Chapter VII) is devoted to providing an answer.

4. A fourth problem concerns the reliability of the test instrument. If a sample of behaviour is shown to be valid then there is a high probability that it will also be reliable. However, if the elicitation method is to be of any great research value this assumption must be shown to be well-founded. This problem will also be examined in Chapter VII.

5. An important question concerns the psychological reality of the analysis. Much recent and contemporary research shows that perception involves and is to a great degree determined by the cognitive models that the perceiver can utilise (Anderson and Bower, 1974; Bruner, 1974; Klatzky 1976; Neisser, 1967; Piaget, various). If this contention be true (and it appears to be well-founded experimentally) then it is legitimate to hypothesize that the linguistic models available to the children studied will influence their perception of language. In its weakest form this argument suggests that underlying both production and reception of language are common cognitive-linguistic structures. These will be tapped in the production of any sentence and (on a Neisserian model

- of perception by synthesis also adopted by Anderson and Bruner (opera cit.)) will be centrally involved in the processes of perception. The hypothesis may be stated operationally:

- (a) children utilising mainly or exclusively unit verbs will perceive time and aspect reference in language directed to them at no better than a random level. They will allocate sentences with different time reference randomly among different time categories.
- (b) those children who have made some progress towards the development of a quasi-normal English verbal morphological system will perceive accurately those elements they use in their own language. They will allocate correctly those time references that they have developed.
- (c) those children who have developed an almost normal English verbal system will accurately perceive normal English time-markers in verbs.

This hypothesis is examined in Chapter VII.

6. Ivimey and Lachterman noted that, although the majority of their subjects made use of unit verbs and external markers of time and aspect, three of them had begun

to develop a system of marking time and aspect reference by means of changes within the verbal component of each sentence. These signs of an emergent verbal morphology were clearly based on that of normal English but there were many deviant features within the system. Additionally differences between the rate of development of be, have and do on the one hand and of normal "lexical" verbs (give, go, come, kick, etc.) could be detected.

One aim of the present investigation was to detect whether these early developmental trends could be seen possibly at higher levels in an older group of similarly handicapped children.

The six substantive and methodological problems discussed above are essentially subordinate to the central aim of the investigation: the study of the linguistic skills of a group of profoundly deaf children approaching the final period of their formal schooling. However, although subordinate they are by no means unimportant, for if the sampling method can be shown to be invalid, unreliable, unrepresentative or of limited application, then the central aim, resting as it does on this sampling method, will not be achieved.

The children studied

Initially it was hoped to find a large group of profoundly deaf children of school-leaving age (i.e. 15-16 years) to study, in order to determine the level of linguistic competence they had acquired during eleven years of a specialised and rather expensive education. In part, this is a study of interest in itself, but it was hoped that it might yield valuable information on some problems of language acquisition and use. A subsidiary interest is that the information gained in this research may be of value in helping teachers, employment officers and social-workers in their work of helping deaf school-leavers to cope with the many problems of living in a world demanding fairly high levels of communicative ability in all spheres: leisure activities, job-training, understanding social, fiscal and commercial transactions and so on. These are in fact implications of the level of language skill reached by the deaf and cannot be directly discussed in this thesis, but it is hoped that the findings may be applicable to a wider domain.

By studying a group which had a rather similar degree of deafness, were of similar age and who had attended the same school for all or most of their school days it was hoped that the theoretical problems of validity and reliability of sampling technique could be examined. Were children to be taken from very different educational environments then any differences in the data elicited might represent either

weaknesses in the sampling method or true differences deriving from differential ability in the children or different methods of teaching and communication used in diverse schools. In the event, and after lengthy search, it proved impossible to find a group of profoundly deaf school-leavers (aged 15-16 years) within one school sufficiently large for within-group regularities to be perceived. Fortunately the author was able to discover a group of twenty profoundly deaf children with rather similar characteristics of socio-economic and racial background who had spent all their school lives in the same residential school. Although these children were, at age 13 years, younger than had been intended it was felt that this was no great difficulty since there is abundant evidence that the intellectual and linguistic development of the majority of profoundly deaf children is very slow.<sup>x</sup> In any case the fact that the author was known to the children, at least by sight, as a result of regular professional visits to the school over a period of some seven years and was well-known to and accepted by their teachers (some of whom were his former students) was felt to outweigh other disadvantages.

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x Many authorities quote an average of one month's intellectual advance for each increase of one chronological year in age.

Table 5.1

Age Characteristics of the Sample

<u>Name</u>	<u>Sex</u>	<u>Date of Birth</u>	<u>Age at Nov. '75</u>
AA	M	22.12.62	12, 10 <sup>x</sup>
SA	F	12.11.62	12, 11
KB	F	7.1.63	12, 9
MB	F	28.9.63	12, 1
CC	F	1.12.62	12, 10
JG	M	28.8.62	13, 2
DG	F	12.12.63	11, 10
JH	F	31.8.62	13, 2
PI	F	25.10.63	12, 0
AP	M	23.1.63	12, 9
BP	M	23.10.62	13, 0
DP	F	17.6.63	12, 4
FR	F	6.10.62	13, 0
MS	M	10.11.62	12, 11
RS	M	22.7.62	13, 3
SS	F	9.12.62	12, 10
LT	F	21.3.63	12, 7
MW	M	22.1.63	12, 9
SW	F	16.1.64	11, 9
TW	M	3.12.62	12, 10

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x By convention 12, 10 represents an age of 12 years  
10 months.

This group includes 12 girls and 8 boys, with a mean chronological age of 12 years 8 months.

#### I.Q. Characteristics of the Group

The I.Q. of each child was measured by the author, an experienced educational psychologist, using a non-verbal test developed for and standardised on hearing-impaired children: the Hiskey-Nebraska test of Learning Ability. Although widely used for the purpose the test was not originally designed for the assessment of I.Q. and evidence is accumulating that I.Q. estimates based on it are too low.

Every child in the group cooperated well during the test and gave evidence of enjoying the experience, so that after the first two or three children had been tested (and presumably had "talked" about it to their peers) there was considerable competition to take part. Thus, within the limits of the test we may have some confidence that the I.Q. is accurate.



Table 5.2

Mental Ages (derived from Hiskey Nebraska test of Learning Ability)

AA	94	BP	68
SA	90	DP	102
KB	81	FR	77
MB	78	MS	94
CC	77	RS	85
JC	89	SS	89
DG	101	LT	44
JH	67	MW	77
PI	83	SW	114
AP	73	TW	77

The mean I.Q. for the group was 83, just below the lower limit of average ability (= 1 Standard Deviation (S.D.) below the mean, where 1 S.D. = 15 points), but this is probably an underestimate as mentioned above. Additional supporting evidence for this conclusion is that

- (1) four of the children made very low scores, which depress the mean of the group;
  - (2) the scores of three of these children would place two of them in the category of E.S.N. (mild) and one of Severely Sub Normal.
- However none of the children behaved like E.S.N. or S.S.N. children.

The author's estimate of the mean I.Q. of the group is that it lies at approximately 90, i.e. low average.

### Hearing Loss Characteristics

The audiograms of all children in the school are checked regularly by a senior member of staff, trained and with long experience in audiological assessment. It is probable that the results below, of responses to pure tones, are accurate, with the possible exception of AA whose responses are reported as very variable.

Table 5.3

#### Hearing-loss characteristics of the children studied

Name	125	250	500	1000	2000	4000	Mean <sup>x</sup>
	(values all in dB above Threshold)						
AA	NR	85	105	110	105	105	102
SA	70	90	90	90	85	80	87
KB	NR	75	85	105	105	105	95
MB	60	75	85	90	95	100	89
CC	NR	80	90	105	115	120	102
JC	-	75	90	105	110	120	95
DG	70	85	120	NR	NR	NR	99
JH	70	80	90	105	100	100	93
PI	70	80	95	100	95	90	92
AP	70	90	105	100	85	85	95
BP	60	75	80	90	85	95	81

x The mean is taken from the average of the 4 "speech frequency" responses (i.e. 250-2000 Hz). Where No Response (NR) was recorded an arbitrary value of 130dB was used in calculating the mean. See Appendix B.

DP	NR	80	95	105	NR	105
FR	70	80	95	110	110	98
MS	NR	80	85	95	110	95
RS	60	75	105	110	NR	110
SS	NR	75	85	115	NR	105
LT	NR	90	105	105	105	100
MW	50	75	90	100	110	97
SW	65	70	80	80	80	78
TW	40	50	70	100	105	86

The mean hearing loss over the "speech frequencies" for the group as a whole is 95.3.

Table 5.4

Tests of homogeneity of the sample characteristics

The age, hearing loss and I.Q. characteristics of the group were tested, using the chi-squared statistic to determine whether the group was homogeneous in its characteristics:

Age:  $\chi^2 = 2.99$  with 19 d.f. N.S.

Hearing Loss:  $\chi^2 = 14.15$  with 19 d.f. N.S.

I.Q.  
(whole group):  $\chi^2 = 51.66$  with 19 d.f.  $p < .001$

(less 3 lowest  
scoring subjects):  $\chi^2 = 27.54$  with 16 d.f.  $p < .05$

We see therefore that the group is homogeneous in terms of hearing loss and age, but that there is some statistically significant variation within the group in terms of I.Q.

### Tests

The language eliciting instrument originally used by Ivimey and Lachterman was used in this study with slight modification. The stimulus cards contained coloured pictures of various incidents:-<sup>x</sup>

1. a man punching a boy,
2. two girls kicking a boy,
3. a boy climbing a tree,
4. two children watching television,
5. a dog biting a postman,
6. a boy walking towards a building prominently labelled SCHOOL,
7. a young child asleep in a bed,
8. a boy tripping over a stone,
9. three double object sentences:
  - (a) a man giving a present to a girl,
  - (b) a girl giving a bone to a dog,
  - (c) a woman giving a £1 note to a girl.
10. various incidents to elicit use of be,
11. various incidents indicating possession (to elicit have)

Items 1 - 3 and 5 were designed to study transitive verbs and human/non-human, singular/plural subjects. In item 4, the subjects were required to give names, in order to test simple

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x The actual incidents are unimportant. They were selected to provide simple and, in general, vocabulary known to deaf children, in order to avoid syntactical difficulties arising from more complex lexical items.

conjunction in the NP subject. Items 6 - 8 were designed to provide examples of intransitive verbs with possibility of locational and directional preposition phrases, while the three cards in item 9 were included to study the use of datives.

The incidents in 10 mainly gave rise to noun-complement structures. In contrast, adjectival structures following be were elicited in the earlier, habituation part of the testing, with pictures of windy, sunny and foggy weather and a boy smiling.

All utterances, whether spontaneous or in response to stimulus cards, entered the corpus of data for subsequent analysis.

Items 1 - 3 were used to elicit the following forms:-

affirmative: present, future, past.

negative: present, future, past.

interrogative: present.

In the affirmative present habitual and continuous stimulus-cards were used.

Cards 4 and 5 were used mainly to study combinations of future and past time with interrogatives.

In the case of items 10 and 11 a range of responses covering present, future and past time, negatives and interrogatives and their combinations was elicited.

Before the test-proper some time was spent with each child to discover whether he knew the difference between today, tomorrow, last week, now, once, everyday and other terms. Teachers assured the author that these terms were known and used in class. "Say no/not" and "Ask a question" were used in class in place of "negative" and "interrogative". The author used speech and signing<sup>x</sup> to ensure that the terms were known, and also required the subjects to respond either verbally or by gesture to cards bearing the words:

<u>now</u>	<u>a long time ago</u>
<u>today</u>	<u>before</u>
<u>tomorrow</u>	<u>last year</u>
<u>next week</u>	<u>everyday</u>
<u>soon</u>	
<u>say "No"</u>	<u>ask a question</u>

- 
- x Three methods of communication are used by deaf children in the study: (1) speech and lipreading are used mainly in communicating with teachers and teacher-like figures. For the most part speech is very poor and lip-reading ability varies greatly between different children; (2) signing in which major concepts are represented by conventionalised posture and movements of one or both hands. This is used mainly among the deaf themselves; (3) gesture or idiographic movements of the hands, pointing or modelling the gross features of whatever is being referred to. This is used mainly to non-deaf and non-teacher people.

In the case of the last an additional card bearing the words:

who

why

where

what for

when

and a prominent question mark was shown, with the indication that the subject could choose one of the examples if he wished. Yes/No questions were omitted here since the investigator could find, in a pilot study, no means of eliciting such a question without actually using one.

A second omission was that of passive forms. Many earlier workers have shown that the deaf find difficulty in understanding these and the work of the author and his students in London has shown that this difficulty can be explained by showing poor or deviant use of auxiliaries and the preposition by. Until it can be shown that the children can use these items accurately there seems to be little reason in trying to study the form that calls for them. It may be that the children have non-standard methods of producing the passive and, in so far as this is the case the methodology is weak.

#### Method of elicitation

1. After the habituation period each child was given a protocol-form and a pencil (children were tested individually). He was presented with a stimulus card and asked in speech (and writing if necessary):-

Write about this picture

2. When something had been written the child was asked:

Is that now, tomorrow or before?

His answer was noted on the protocol.

3. The sentence and answer were then covered up by a sheet of paper and a card was produced, bearing a time word, e.g.

Yesterday .... The subject was asked Now write the same  
but say "yesterday" ...

In some cases the subjects used the words exposed on the stimulus cards, but more did not. In this latter case, as a check on the time reference of the sentence, the tester asked the child which time he intended and his answer was also written on the protocol.

In many cases the subjects did not copy the stimulus time card but, when they had finished, volunteered the time reference, writing it in brackets on their protocol. This process was repeated for each item throughout the test.

Initially the children were asked to say the sentence before they wrote it and this was recorded on tape, with the intention of attempting a comparison between spoken and written language, but the articulation of the children was in general so poor, that the recorded speech was virtually indecipherable and this part of the investigation was abandoned.



Reliability of the eliciting instrument

After a period of six months the eliciting test was re-administered to a random sample of six of the original children, in order to test for reliability.

Additional language samples of a more spontaneous nature were obtained by the children's class-teachers in order to:

- (1) provide a yardstick against which the elicited sample could be checked, and, if this latter were shown to be valid, to
- (2) supplement the necessarily limited forms obtained during the formal test-elicitation sessions.

Teachers were asked to give as little help as possible to their pupils, to confine this help to the supplying of items of vocabulary and to keep records of what help was given. In the event very little actual help was given but, a most important point, the children seem to have incorporated items supplied unaltered in their written work.

Teachers were asked to obtain several different kinds of written language and to incorporate this, as far as possible, into their normal classroom work, in order that the children would not especially try to produce unusual items. One item only was insisted upon: a diary account about an

imaginary "Next weekend", or a story written in the future, in order that spontaneous use of non-past verbs could be examined. Most children produce work apparently with past reference: diaries, stories and accounts of visits to places of interest. Since the form of verbs in these accounts is a mixture of past and present (with the former predominating) the assumption is usually made that the children intend reference to past time but make many errors. Insistence on a diary about "Last weekend" and an account referring to the future should give insight into the actual validity in spontaneous language of the unit verbs reported by Ivimey and Lachterman. (Appendix C.1).

Three series of simple pictures were provided to act as stimulus for further written work. The picture sequences depicted:

- (a) 2 children going for a picnic,
- (b) a young child shopping with his mother in a supermarket,
- (c) a family moving to a new house.

Teachers were asked to ensure that children wrote about two at least of these sequences. In addition a purely spontaneous story was sought. Some teachers went beyond this minimal list of five pieces of written work and supplied the author with additional Diaries and Stories.

Table 5.5

Nature of the spontaneous written language obtained

	Total	Diary (Past)	Diary (Future)	Picnic	New House	Supermkt.	Free
AA	3	1	1	1			
SA	5	1	1	1	1		1
KB	8	2	1	1	1		3
MB	5	1	1	1	1		1
CC	5	1	1	1	1		1
JC	5	1	1	1	1		1
DG	7	2	x		1	1	2
JH	8	2	1	1	1	1	2
PI	6	1	1		1	1	2
AP	7	1	1	1	1	1	2
BP	8	3	x		1	1	2
DP	7	3	x		1		3
FR	5	1	1	1	1		1
MS	9	3	x		1	1	3
RS	5	1	1	1	1		1
SS	5	1	1	1	1		1
LT	8	2	1	1	1	1	2
MW	7	1	x		1	1	3
SW	7	2	x		1	1	2
TW	6	3			1	1	1

x Children marked thus repeated the "New House" story in the Future.

In a rather small number of cases some children missed items as a result of absence from school.

### Completion Tests

Since the elicitation test entailed a time of 60 - 90 minutes for each child, the number and variety of lexical items that could be explored was limited. Additional tests to supplement the elicited sample were designed to explore:

#### (1) Use of prepositional phrases

This consisted of a photocopied booklet with pictures of two objects in juxtaposition. Beneath each picture was a half-sentence for completion:

<u>Picture</u>	<u>Sentence</u>
(a) ball on table	The ball is .....
(b) girl putting doll into a box	Mary is putting the doll .....
(c) box in front of a television set	( The box is ..... ( The television is .....
(d) boy standing beneath a tree	Tom is standing .....
(e) aeroplane flying over a ship	( The aeroplane is flying ..... ( The ship is sailing .....
(f) toys in a box	The toys are .....
(g) cat sitting under a table	The cat is sitting .....
(h) school and boy	Tom is .....
(i) a boy writing in a book	I can write ..... a pen.

(2) Mechanical production of verb tenses

A booklet was prepared for each child. In this, one page contained a series of sentences with verbs in the present:

I cut the paper

Peter jumps over the river

etc.

on the opposite page were sentences with verbs missing:

Yesterday I \_\_\_\_\_ the paper

Last week Peter \_\_\_\_\_ over the river.

Children were instructed by their teacher to complete the test with a verb in the past.

Comparison between language production and perception

In order to examine the hypothesis discussed earlier, of the relationship between language production and perception a booklet was prepared for each child. This booklet contained the same sample of sentences illustrating the following verbal structures:

<u>Present</u>	simple/habitual	4
	continuous	2
	be + adjective	2
<u>Future</u>	simple	3
	continuous	2
<u>Past</u>	continuous	4
	simple	6 (2 weak) (4 strong)
	Perfect	7

The sentences were presented in randomised order. The children were supplied with a list of time words:-

<u>yesterday</u>	<u>last week</u>
<u>tomorrow</u>	<u>next week</u>
<u>today</u>	<u>next year</u>
<u>everyday</u>	<u>last year</u>
<u>before</u>	<u>soon</u>

The task in this test was to select and write one of the time words for each sentence, in order that understanding of time-marking cues in normal English could be tested.

#### Control group

The test of tense perception was administered to a control group of 30 normally hearing children of average intellectual ability and aged 7 - 8 years. They were matched with the deaf children on Reading Ages: both had Reading Ages of 7 years. The hearing children lived in a large "overspill" housing estate on the eastern outskirts of London and were attending a day primary school.

## CHAPTER VI

### The Syntax of the Elicited Sample of Language

After collection of the data the sentences<sup>x</sup> written by the children on their protocols were reclassified according to the stimuli used to elicit them. Since Ivimey and Lachterman applied a very similar test to a group of hearing children (Lachterman op. cit.) we can establish a tentative relationship between normal English form and the time/aspect references of the eliciting stimuli.

<u>Eliciting Stimuli</u>	<u>English Categories</u>
Today, now	present continuous
Everyday	present habitual
Soon, tomorrow	future
Last week	past
A long time ago	
Yesterday	
Before, finished	

In general the deaf tended to treat "everyday" as a stimulus with present reference, but some children indicated past time. In these cases two stimuli were combined: everyday ..... now, in order to investigate the present habitual. These examples also allow us to examine whether the deaf subjects can dis-

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x This term is used impressionistically here. It will be defined later.

tinguish between past (undifferentiated but usually simple) and past habitual time reference. Similar categories were also used in classifying negatives, interrogatives and be and have.

From these classifications it is possible to extract additional data about nominal, verbal and various sorts of prepositional phrases as well as differences in handling of transitive and intransitive verbs.

After this classification the data were inspected for regularities of structural relationships between the elements forming the utterances. This analysis was carried out at three different levels:

(a) the mesostructural, essentially the affirmative sentence and its modifications;

(b) the microstructural, consisting of sub-sentence structures (various sorts of phrase and sub-phrase elements);

(c) the macrostructural, involving sequences longer than, and usually containing more than one sentence. This level is susceptible of treatment at two different levels:

(i) extended (or complex) sentences, consisting of conjoined and embedded structures, subordinative constructions, etc.



(ii) theme structures. These cannot be studied in the elicited data because here, attention was focused on single utterances. However, the information gained from analysis at levels a, b and c(i) enable us critically to examine more extensive texts written spontaneously by the subjects.

It is a truism to state that one cannot study sentence structures without first (a) defining in independent terms what is meant by sentence, and (b) describing the nature of the elements that combine to form sentences and that must be themselves defined in terms of the sentence they form.

The first point is of real importance and several writers have discussed the difficulties experienced in determining the limits of any sentence in the written language of the deaf, especially where punctuation cannot be relied upon. Examples from the present study illustrate this problem.

Why the naughty girl kicked a boy leg make the boy cry?

Tomorrow the man smack his face the boy sad.

When the postman was posting the letter and the dog came its barked and run to pull the postman trousers.

The first of these examples, allowing for the apparent time differences in the verbs (which are probably unit verbs) could reasonably be seen as two sentences conjoined by juxtaposition. Sentence two appears more clearly to be formed of

two separate sentences and could, following the Heiders' suggested procedure (see above, p. 20 ) be so treated:

Tomorrow the man smack his face. The boy sad.

(Here again we have a unit verb, omission of be and confusion of pronoun and antecedent, all common features of Deafish<sup>x</sup>). In order to explicate the third sentence greater ingenuity would be needed, but one possible solution would be:

When the postman was posting the letter the dog came. Its barked and run to pull the postman trousers.

Such analyses and explanations may be valid but they are rejected in this study for two reasons:

(i) They involve the application of the criteria of normal English to Deafish. This may be appropriate but there is no evidence to suggest that the sequence when + continuous + perfective, common to English has any part in Deafish. The frequent occurrence of unit verbs in the latter suggests that this is an unwise assumption. Further, it is possible, as will be shown later that when is in fact, in deafish, a pseudo-form, having very different grammatical

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x In order to save lengthy circumlocutions and to contrast the language with normal English, this term will be used in this thesis. It is offered only provisionally for the present.

status from that of English. Whether the suggested explanation is valid or not is, methodologically irrelevant. Halliday states that "every language must be treated as if it was unknown" (Halliday, 1961 in Kress, 1976, p. 56). To assume any given structure ab initio and before any systematic analysis has been made is to prejudge the issue. It is the structural nature of deafish that is being sought.

(ii) The procedure involved in attempting to determine the actual lengths of various sentences is crucially important only in analysis based on M.L.U., type-taken ratios, etc. In an earlier chapter grounds for rejecting this approach have been given so that the question largely disappears.

For the purpose of the present study the term sentence is defined pragmatically as the response to a single eliciting stimulus complex. The greater number of sentences, 97% of a total corpus of nearly 2,000 sentences, are relatively simple and short, containing a single verbal core. The small proportion of longer sentences must be treated on their merits in terms of total structures: what may appear to be examples of incorrectly conjoined English sentences may be quite correct and normal Deafish complex but unitary structures. As will be shown, the 97% of simple sentences consist mainly of a subject-verbal-(optional) object sequence, with a fairly large number containing supplementary contextual information mainly in the form of prepositional phrases of one sort or

another.

The second problem, of defining a structure which consists of smaller units themselves defined by the structure, is theoretically more serious. However, a structure does not exist in isolation from the elements that comprise it and, since one must begin an analysis somewhere, one may initially define these elements impressionistically on the basis of semantic function as well as position co-occurrence and substitutability (Robins, 1964, p. 224). These elements can be shown to enter into regular interrelationships with each other and common patterns of these relationships repeated over relatively short stretches of utterance can be tentatively defined as typical sentences. Thereafter the elements themselves can be more rigorously examined, both on the inter-phrasal level as well as more finely at the word and/or morpheme level. The results of this examination may be re-applied to the initially impressionistic sentence analysis and may entail its modification. In particular, varieties or transformations (the word is used in a non-T.G. manner) of sentence can be examined in the light of this rigorous sub-sentence analysis. A fourth stage will involve the detailed study of combinations of sentences in which the sentences themselves may be shown to possess specific positional, co-occurrence and substitutability relations. If what has been defined on the basis of micro-structural data as a sentence can be shown to function as a relatively stable and unitary entity at the macrostructural level, then the initial pragmatic and provisional definition

is strongly confirmed.

The basic unit of analysis thus becomes the sentence, defined operationally as the commonest form or forms of utterance-response to a series of related stimulus complexes. A subordinate but still important consideration will be that a typical sentence appears as a conceptual and behavioural unit, executed smoothly and, for the most part, without interruptions.

Since the elicitation method rests on the initial production of affirmative sentences, which are then varied systematically in several directions, the first level of analysis will be confined solely to affirmative sentences. This process is merely convenient: no claims are made that such sentences are in any way psychologically nor linguistically more important or basic than any others.

Affirmative performative sentences: a preliminary analysis

A preliminary formal analysis of the 273 affirmative sentences (i.e. words indicating mainly an activity and excluding be and have) in the corpus brings out the elements of crude structure. The following, largely impressionistic categories were used in this analysis:

<u>Category</u>	<u>Symbol</u>	<u>Examples</u>
Nominal phrase	N	(i) names ) singly or in (ii) nouns ) combination (iii) pronouns (iv) determiner (adj.) <sup>x</sup> noun
Verbal phrase	V	(i) unit verbs (ii) verbs with auxiliaries
Prepositional phrase	prep.	nominal phrases often preceded by prepositions
Dative phrase	dat.	Indirect object in double object sentences
Possessive phrase	poss.	English genitival phrases or their sub- stitutes.

These different categories appear in a rather restricted number of patterns or "repetitions of like events" (Halliday op. cit., p. 59).

In several ways the approach adopted here resembles that of Crystal (Crystal et al., 1976) but there is one major difference. Crystal has erected a taxonomic system of language development against which any language sample may be compared. This system is very clear and is potentially of great use to teachers and speech therapists dealing with the developmental problems of normal or quasi-normal language. However, in this research, the language of deaf children seems so deviant that it was felt to be more appropriate to set up a taxonomy within the sample itself, rather than to impose upon it an independently developed one.

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x Forms in brackets are optional.

Table 6.1

Structural patterns in affirmative sentences

<u>Sequence</u>	<u>No. of Examples</u>	<u>Used by</u>
NV	12	8 children
NVN	115	20
NVN dat/NV dat N	54	x
NV prep prep	8	5 <sup>xx</sup>
Other	6	3

x NVN dat was used by 14 children

NV dat N was used by 11 children

9 children used NVN dat exclusively, 6 used NV dat N  
exclusively.

xx In different combinations.

It must be noted that the sequences detailed in Table 6.1, although derived from normal English categories, may appear in non-English forms. Thus some "prepositional" phrases may not, in fact, contain prepositions:

The baby slept the bed

In such a case the post-verbal nominal is taken to be a potential prepositional phrase for two reasons:

- (i) impressionistically, in terms of normal English;
- (ii) it gives locational evidence (as do some other prepositional phrases) rather than expressing a straightforward "object" of the preceding verb.

In other cases the NV dat N and NVN dat may appear in unEnglish guise:

Mummy gave one pound the little girl

Today mother giving to him present

When we examine the protocols of the children we see that each child tends to use a rather restricted set of sequences.

Table 6.2

Structural sequences used by individual children

Group 1: Three sequences

<u>Child</u>	<u>Sequences</u> <sup>x</sup>		
AA	NVN	NV prep	NV dat N
KB	NVN	NV prep	NV dat N
AP	NVN	NV prep	NVN dat

---

x In this categorisation prep normally indicates a locational or directional phrase, inst. an instrumental phrase. Actual examples are given later in the text.



Group 2: Four sequences

(a)	MB	NVN	NV prep	NV dat N	Other			
	FR	NVN	NV prep	NV dat N	Other			
	MS	NVN	NV prep	NVN dat			NV	
(b)	JH	NVN	NV prep	NV prep prep	NVN dat			
	TW	NVN	NV prep	NV prep prep	NVN dat			
	JC	NVN	NV prep	NV prep prep	NV dat N			
	RS	NVN	NV prep		NV dat N	NV	inst	
(c)	CC	NVN	NV prep		NV dat N	NVN dat		
	DG	NVN	NV prep		NV dat N	NVN dat		
	SS	NVN	NV prep		NV dat N	NV dat N		
(d)	SW	NVN	NV prep		NVN dat	NV		
	PI	NVN	NV prep		NVN dat	NV		
	DP	NVN	NV prep		NVN dat	NV		

Group 3: Five sequences

LT	NVN	NV prep	NVN dat	NVN dat N	NV
MW	NVN	NV prep	NVN dat	NVN dat N	NV
BP	NVN	NV prep	NVN dat	NVN dat N	NV

Group 4: Nine sequences in all

SA	NVN	NV prep	NV prep prep	NVN dat	NV dat N	NV	Other
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This analysis is not vacuous. It demonstrates clearly that Fusfeld's conclusion, quoted in the Introduction, that in Deafish words occur in profusion but show no systematic



The post-verbal nominal(s) possess many functions but in these examples resemble normal English objects of various kinds.

A functional analysis also enables us to detect interesting differences within the class of prepositional phrases. These will be discussed in greater detail later, but for the present, we can see that all children are able to use at least one prepositional phrase, and some use two or even three, to supply additional information about the context in which the basic NV (N) sentence is operating. This context is often locational or directional:

#### Locational phrases

<u>Before daddy smacked (in the face)</u>	<sub>loc</sub>	TW
<u>The boy fell down (on the land)</u>	<sub>loc</sub> (Pt)	TW
<u>We played (the swing)</u>	<sub>loc</sub> (P)	TW
<u>The baby slept (on the bed)</u>	<sub>loc</sub> (at 6.0 p.m.)	(Pt) SA
<u>Baby boy is sleep (his bed)</u>	<sub>loc</sub> (P)	SA

#### Directional phrases

<u>Now he jumped (on the grass)</u>	<sub>dir</sub>	TW
<u>Philip went (to school)</u>	<sub>dir</sub> (P)	TW
<u>The boy climbed (up the tree)</u>	<sub>dir</sub> (P)	SA

In some rare cases several prepositional phrases may be combined to indicate comparatively accurately the total context of the sentence:

The boy climbed (up the tree) (in a farm) (P) SA  
dir loc

(At 4 o'clock) Jane and Peter is watched  
temp

Play Away (on the television) (F) SA  
loc

The boy is jumped (over the river) (on the  
loc

grass) dir (Pt) JH

one child offered a reason (although of a very limited kind)  
for the activity.

Her mummy gave Julie £1 (for her birthday)  
reas  
(P) SA

and one child spontaneously introduced an instrumental phrase:

Father was banged a boy's face (by a hand)  
inst  
(P) RS

The Heiders (op. cit.) characterised Deafish as mainly descriptive, very rarely interpretive, i.e. their subjects described events and very rarely explained why they happened. Such an explanation can be achieved in various ways, the commonest of which is addition of a phrase introduced by for as in the example of SA above. Such a device is relatively simple, yet it occurred in the elicited corpus of data only four times, usually in SVO dat. sequences. Another child appears to have aimed at this but produced a confused

sequence:

The boy gave a girl (for Christmas) present RS  
reas

(It is possible that this represents confusion between  
present for Christmas and Christmas present)

The same boy also tried to explain why another action  
occurred, using two sentences:

The boy was rude her father. father was angry  
and he banged a boy's face by hand. (Pt)

It will be shown later that some other explanatory devices  
mainly in the form of causals and pseudo-causals are also  
used. This preliminary functional analysis thus supports  
the Heiders' assertion: although explanations are not absent,  
neither are they at all common at this stage.

An extended functional analysis was made of the  
affirmative sentences, using the following categories:

S = subject  
V = verb  
D = directional phrase  
L = locational  
dat = dative  
other = a thin scattering of temporal, instrumental  
and other phrases



Table 6.3 preserves the form, in its essentials, of Table 6.2, but recategorises some of the children in the lower groups. A sizeable group of five children (25% of the total) confine themselves to making relatively simple statements, modified very slightly by ancillary contextual data in the shape of locational and directional phrases. Group 2(b) seems not much better and might appropriately have been classified below Group 2(a), who all show signs of attempting to extend the range of contextual information they are trying to communicate. However, Group 2(b) shows one notable advance on Groups 1 and 2(a): they utilise two different forms of dative:

John gave Mary a present

John gave a present to Mary

Since these forms are both used by normal English speakers this ability to use two parallel forms may lead to greater skill in recognising them and thus interpreting incoming information. In principle, the children in Groups 2(b) and 3 may interpret some incoming messages more correctly than those in Groups 1, 2(a) and 2(c).

In the Table Group 2(c) is placed in advance of 2(b) largely because the children seem to have passed a rather different important stage: statements need not always adopt the triadic form:

S - V - x

(where x = O,L,D, etc.) but may appear as dyads:

S - V

The exact nature of this advance is uncertain, but it may reflect a movement towards greater syntactic flexibility.

The discussion above is open to a number of serious objections, not the least of which is that because a form does not appear on any single occasion one must not assume that it does not exist. Thus in Table 6.3, AA might have at his disposal as many different contextual-specification rules as SA, but on the occasion when the test took place he either chose not to use them, or the situation did not seem to him to call for making use of them. Such an argument is unanswerable - but neither is it provable! We shall see later, that there is a great similarity between elicited language and spontaneous language. An objection like that above would be rather more difficult to sustain if similar structures appeared in half a dozen spontaneously produced accounts collected on different occasions over a period of several months. For the moment, we must accept the evidence as it stands: different children appear to express ancillary contextual information to different extents.

Some of the structures used appear to be either very rare or idiosyncratic to a single child, and not too



much attention should, perhaps, be devoted to them. The commonest structures are shown in Table 6.4:

Table 6.4

Commonest structures in affirmative sentences

<u>Structure</u>	<u>% of total affirmative corpus</u>
SVO	44.0
SVL	18.9
SVO dat	12.4
SVD	11.6
SV dat O	8.5
SV	4.6

The imbalance between SVO and the rest is unimportant: the test elicited more SVO sentences than others. What is interesting is to compare this distribution of structures with that used by the original sample of Ivimey and Lachterman's younger children. These data are not given by the authors, but have been extracted from the original protocols. Identical stimulus complexes were used to elicit the sentences in each case.

Table 6.5

Comparison of affirmative structures used by younger and older children

<u>Structure</u>	<u>Younger Group</u>	<u>Older Group</u>
	( % of corpus )	
SVO	72.0	44.0
SVL	2.7	18.9
SVO dat	7.0	12.4
SVD	3.1	11.6
SV dat O	7.6	8.5
SV	12.0	4.6

The proportions in Table 6.5 appear to suggest clear differences between the groups and the raw data underlying these were tested for statistical significance using the  $\chi^2$  Statistic (Siegel, 1956) under the null hypothesis that the differences are purely random, arising from chance differences in sampling.  $\chi^2$  was found = 19.875 with 5 degrees of freedom, giving a probability of less than 1/1000 that differences of these magnitudes could arise by chance and the null hypothesis can be rejected.

The implications of this finding are interesting. Locational and directional phrases provide additional information, setting or defining the context of the major action described in the SV or SVO sentence. We see that the younger deaf children make very limited use of this technique,

confining themselves mainly to relatively rigid SV and SVO structures. It may be that this underlies the statements of some earlier workers, notably Simmons (op. cit.) who described the language of his subjects as "'straight' but quite quite rigid and stereotyped". It will be recalled that in Chapter I it was commented that the description, as it stood, was of little value since it offered too little information. If, indeed, Simmons was referring to similar structures as that noted here, then the present study enables us to achieve greater precision in description.

The differences noted may also underlie the frequently reported increase of M.L.U. in Deafish. The sentences of the older children tend to be longer because the children are attempting to give more explicit, additional information. Although in Table 6.5 relatively infrequently occurring structures have been ignored, 11 examples can be found, including SVLL, SVDD, SVDL, SVO Instrumental, and so on. Eight of the oldest children (40% of the total) attempt to use one or more of these longer and informationally more explicit structural patterns, whereas only one of the younger (9% of the total) did so. This must surely mark an advance in communicative ability and cause an increase in sentence length.

However, several writers have given different figures for this increase in MLU and this would surely be substantiated in a cross-sectional replication of the

elicitation method. As compared with the younger children, the older ones make greater use of adjectives and other modifiers (as will be shown in detail later) and this will not only reflect increasing maturity, but be seen in an increase in M.L.U. However, use of modifiers may often be very faulty (in normative terms) at whatever age and may result in incorrect estimates of M.L.U. Thus, for example, one of the younger children wrote:

The two girls been kick to the small boy

with past reference. This sentence should be compared with that of an older child, T.W.

The girl kicked the boy

The younger child has reached greater maturity in his use of adjectives (which earn for him additional values of words per sentence) and in number marking (which does not). But use of been kick (attracting an extra mark) does not seem to indicate any superiority over kicked. Since the younger child used to after more verbs he would presumably be given additional credit for number of words per sentence. The younger child would, in this example, score 9 words per sentence, the older 5,

Since no exact details of actually what was written are given in any MLU analysis one cannot be sure which elements have been counted and which not, and it is possible that

differences like those discussed may be at the root of the frequently contrasting reports. It may be that the younger child's sentence would be dropped from the corpus because it is obviously erroneous, but then so too should that of the older child, since girl "should" read girls. But in such a case there would be very little to compare and valuable data about what Deafish "is" (rather than what each investigator believes it "should be") would be lost.

In fact a comparison of MLU's of younger and older children's affirmative sentences was carried out:

Table 6.6

Comparison of MLU's for 2 age groups

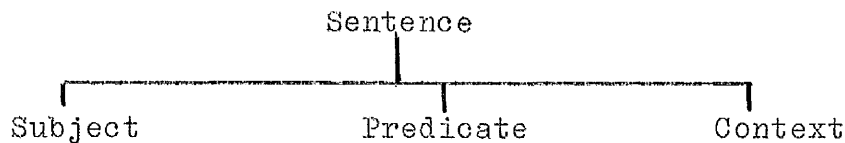
	M.L.U.
Younger Group	5.979
Older Group	6.602

This shows some increase, although one that is statistically insignificant. The figures probably obscure more than they reveal, since a reliance in MLU's would direct observation from the sort of information shown in Table 6.5.

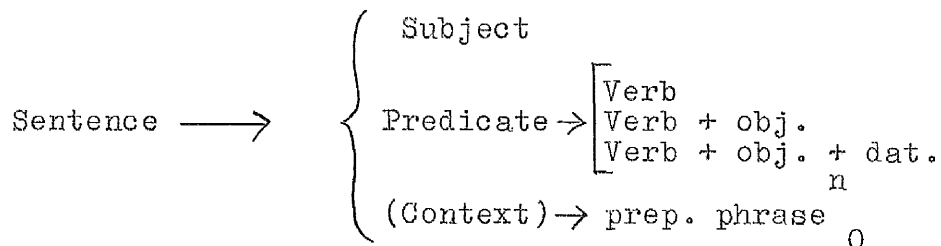
This initial analysis of the affirmative sentences of the deaf children studied has established two facts:

- (i) the children do not simply concatenate words and phrases into relatively random sequences, but into ordered patterns;
- (ii) that although the structures used are restricted, rigidly applied and fairly primitive, many children are actively striving to express additional contextual information and in this have made a distinct advance over children three years younger.

A basic structural paradigm for affirmative sentences in Deafish has been given above:



Since the predicate unites at least three possible structures: VO, VOdat, V<sup>o</sup>, and context may be represented by any number, including zero, of prepositional phrases, this paradigm may be extended. Since this paradigm may be fruitfully seen as mapping the number of structure choices open to each child, we may tentatively adopt a form of notation used, among others by Halliday (op. cit.) and Hudson (1971):



In the notation the brace, { , indicates an and relation, the parenthesis, ( , an optional constituent and the square bracket, [ , an or relationship. Thus, in the group as a whole, a sentence may appear as one of the following possibilities:

- |               |  |
|---------------|--|
| (i) SV        | (iv) SVO cont. <sup>x</sup>                      |
| (ii) SVO      | (v) SVO cont. cont.                              |
| (iii) SVO dat | (vi) SVO cont. cont. cont.<br>(see Note 2 below) |

(This notation would allow the pattern SVO dat cont. to appear. No examples do but it is not inherently unlikely that they could, if a situation demanded it.)

It may be that a more parsimonious description of the predicate alternatives is possible but for the present the description offered has the merit of clarity and will be used purely as an initial working diagram. These supplementary statements must be made:

- (i) SVO dat may appear also as SV dat 0;
- (ii) the greatest number of prepositional phrases used by any child is three. Most children make use of none or only a single one. The upper limit, n, of number of phrases should be interpreted for the moment as finite (and probably very restricted).

---

x cont = contextual phrase

(iii) the ancillary nature of the prep. phrases  
is seen in that they appear to have some  
structural freedom and one or more may  
migrate from sentence end to other positions:

(At 4 o'clock) Jane and Peter is watched Play Away (on the  
television)<sup>temp</sup> (F) SA  
<sub>loc</sub>

This is, however, very rare. Most prep.  
phrases occur towards the ends of sentences.

#### Sub-sentence or microstructural forms

##### I Action-core phrases (Verbal phrases)

The elements forming the set of action-core phrases  
can be distinguished on a number of grounds. In many cases  
the simplest and most obvious is the similarity with normal  
English verbs: they commonly indicate some activity on the  
part of the logical subject, which in general coincides with  
the grammatical subject. Moreover, they frequently carry  
affixes and/or are linked with other elements resembling  
tense, aspect and modal machinery in English (auxiliaries).  
Although in a large number of cases these elements do not  
carry normal English implications about time and aspect  
(i.e. they represent unit-verbs), as the children grow older  
and begin to construct more sophisticated linguistic models  
these affixes and auxiliaries do take on some fairly consis-  
tent time-signalling functions. A further criterion is that  
in negative meso-structures it is these words that carry the



exponent of negation: not, did not, etc.

Since these elements closely resemble normal English verbs one may question the motivation for adopting a new terminology. Two reasons may be used to defend this:

(i) In some cases the action-core word (A/C) may not resemble a normal English word:

Before the boy is over the river JC

The boy was over the river before CC

In each case over was accompanied by a manual sign indicating jumping. It may be that the children involved had carelessly omitted the verb, although why several should omit the same word in this position (while in general not omitting other major meaning constituents) would pose a problem for this line of explanation. One boy, RS, used over exactly like any other A/C in his corpus:

Before the boy over the river and fell over on  
the grass (Pt)

The boy will be try over ..... (F)

Soon the boy will over ..... (F)

but omitted no others. It may be more appropriate to accept over as an A/C word for many deaf children than to see it as representing incorrect English usage.

The same subject also uses birthday in a similar way:

Tomorrow the girl will be birthday for one present

while another girl, PI, uses present like this:

The boy present for you.

A second justification for adoption of a new class name is heuristic and has been discussed before; the danger of using English categories in describing a new and unknown language. Such a procedure entails two possible and contradictory errors: on the one hand the child may, because his English is deviant, be classified as alinguistic. We have seen above that this is the conclusion reached, among others, by Furth and Fusfeld. On the other, the investigator may read intentions into the child's utterances, as was done, for example, by Morehead and Ingram with the language of language-disordered children. Thus, The boy over the river may be interpreted as "really" meaning:

The boy jumped over the river

The boy is jumping over the river etc.

with the conclusion that the subject really "knows" jump and past or present continuous or whatever the investigator chooses, i.e. the investigator describes an amalgam of his and the child's language.

(ii) Non-action verbs, like be and have appear to function rather differently from the others and it may be appropriate to adopt a clear distinction between these essentially attributive verbs and the rest. Since these frequently reflect some form of action and, occur near the core of sentences, the term action core (abbreviated A/C) seems appropriate, although in some cases a rather loose use of the term verb may be used instead.<sup>x</sup>

#### The younger group

8 out of 11 (73%) of the younger children studied by Ivimey and Lachterman used unit verbs: A/Cs which appeared in normal English past or present form but with no consistent past or present time-reference. Examples have been given earlier and can be seen in the samples quoted in this chapter. It will be recalled that a careful quantitative examination of the form and reference of these A/C words showed that:

- (1) a "verb" with normal English present form is as likely to refer to non-present time as to present.
- (2) past time is indicated by a "verb" with present form twice as often as one with past form;
- (3) will occurs rarely. Where it does it is linked exclusively with future time reference, although futurity is more likely to be indicated by a "verb" in past or present form.

---

<sup>x</sup> The term verb will be used mainly in references to earlier reports, as below.

- (4) a "verb" in past-form has a 3-1 probability of referring to present time rather than to past.

Where specific time reference was desired it was indicated by a word or gesture indicating present (pointing downwards in front of the shoulder), past (pointing backwards over the shoulder) or future (pointing forwards). In writing, this word may occur at the beginning or end of the sentence and is, structurally, external to the sentence, hence the terms used by Ivimey and Lachterman:

external marker and unit verb

These facts clearly expose the dangers inherent in relying on spontaneously produced data. Without clear and independent evidence the time reference of any sentence produced by young deaf children is unknown. Any analysis is likely to be erroneous.

In contrast three of the younger children were moving towards a more complex system utilising time-marking devices more closely linked with the "verb". These devices are clearly derived from normal English but do not have English reference;

- (1) a single verb (V) or the form is V has a  $\frac{2}{3}$  probability of referring to present continuous activity;

- (2) (is) V ing (where is is optional) tends to be confined to present habitual and future activity;
- (3) will, often occurring with other elements (e.g. will (go) V (ing)) always indicates futurity;
- (4) V + ed has a 55% probability of indicating past activity.<sup>x</sup>

It was concluded, that these three more advanced children were moving with great uncertainty towards a system in which time-reference was indicated by morphological changes to the 'verb':

<u>V, is V</u>	=	present continuity
<u>V ing</u>	=	present habitualness
<u>will V</u>	=	futurity
<u>V ed</u>	=	pastness

Vowel changes as seen in English strong verbs have no systematic time reference.

#### The older group

Among the older children, only one, TW, appears to be in the most primitive stage of exclusive use of unit-A/C words:-

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x The values given refer to actual usage (Ivimey and Lachterman, op. cit.)

Paul and Jane watched the television (P)

The boy went to the bedtime (P)

Daddy smacked the boy (P)

Yesterday Jane and Paul watched the television

Before Daddy smacked the boy

Tomorrow Jane and Paul watched the television

Tomorrow Daddy smacked the boy

Where be was used, a similar pattern emerges

Today it was sunny

Yesterday it was raining

Tomorrow it was foggy

Since much of the written work of deaf children appears to be linked with past activities (Diaries, stories, etc.) any spontaneous utterance of TW would appear like:

Yesterday it was raining. Daddy smacked the boy ....

with apparently correct time marking. The evidence obtained in the elicitation method shows that this would almost certainly lead to an overestimation of his linguistic competence.

Although the unitary form of A/C's appears in all cases in the protocol of only one child, it can be found to varying degrees in those of all the children. In Table 6. calculation of percentages is based only on examples when it is possible to detect the existence of unit A/C's with some confidence, i.e. where the form is found with at least two different time references. For example, in a protocol selected at random, we find the following action-core words occurring in affirmative sentences.

Table 6.7(a)

Potential and actual unit A/C's of MW

Time/Aspect reference

<u>Present</u>		<u>Future</u>	<u>Past</u>	
<u>Continuous</u>	<u>Habitual</u>		<u>Simple</u>	<u>Repeated</u>
jump				
kick	<u>was kick</u>	will kick	are kick	<u>was kick</u>
<u>climb</u>	<u>climb up</u>	<u>climb</u>	<u>climb</u>	
<u>smack</u>	<u>smack</u>	will smack	<u>smack</u>	
<u>are watch</u>		<u>are watch</u>	were watch	
<u>bite</u>		<u>bite</u>	<u>bite</u>	
was caught				
<u>go</u>			<u>go</u>	
<u>give</u>		<u>give</u>		
gave				
		ran		
		said		
		fell over	fall down	

= possible occurrence of unit A/C's (26)

       = actual occurrence of unit A/C's (18)

Thus the ratio of actual to potential unit A/C's is just under 70%. Give and gave with present continuous reference are examples of vowel differences in free variation as are probably fell and fall. It may be that in a larger corpus of data jump and ran would also appear as unit A/C's, raising the proportion of these. Conversely they might not,



reducing the percentage. Thus no great reliance can be placed on the actual figures given. At most it gives some indication as to the extent to which an investigator's confidence in MW's ability to communicate time and aspect data would be misplaced. In contrast, JC's A/C words appear to be rather more accurate:

Table 6.7(b)

Potential and actual A/C's of JC

<u>Time/Aspect reference</u>			
<u>Present</u>		<u>Future</u>	<u>Past</u>
<u>Continuous</u>	<u>Habitual</u>		<u>(Simple)</u>
is walks		is walking	
<u>punched</u>	is punched	will punched	<u>punched</u>
is kicking	was kicking	will kicking	had been kicking
is climbing	is climbing	will be climbing	was climbing
is watching		will be watching	had been watching
pulls		will be pulled	
is going			
gave			has given
give		will give	had given
		stops	
			sit
			was posting
			came
			barked
			run
			trips

JC produces 24 possible unit A/C's of which only 2 are actually of this nature (8%). is punched and will punched and the various forms of kicking may represent vestigial traces of an earlier, more widespread system. Gave/give again appear to be in free variation while sit, came, run, trips, (all with past reference) may be candidates for unit A/C status. The different forms in the past: V-ed, had been V-ing, has/had V-ed, etc. appear to have no systematic time and aspect reference. They may be pseudo-forms (discussed later).

Once again, the actual size of unit A/C usage is only approximate, but it is clear that JC can communicate more precisely and exactly an important element of meaning: time. In contrast he cannot yet distinguish aspect in his verbal units.

Table 6.8

Proportions of unit A/C's in affirmative sentences

Group	I	II	III	IV
JC	8	FR 23	SA 46	SW 71
AA	9	CC 25	KB 48	MS 82
SS	9	MB 30	RS 55	AP 82
			DP 55	JH 83
			LT 64	PI 88
			MW 69	DG 91
				BP 95
				TW 100

Table 6.8 shows the extent to which the children studied use unit-A/C structures in their written language. In only three cases (15%) can we be sure that the children are actually differentiating between various time-references with any certainty, with another three cases approaching this level of sophistication. In contrast eight children (40%) make virtually no distinction at all. The remaining six (30%) are little better. Although it must be emphasized that the figures are little more than fairly uncertain estimates, we have established that for nearly seven deaf children in ten at age 13 years there is little or no relationship between form of A/C word and time reference.

The extent of this is shown in Table 6.9 where the action core words of the group are entered in a two-way matrix showing apparent form and target time reference.

Table 6.9

Form/Reference Relationships in Affirmative Sentences (Raw Scores)

Form

	Pr.Cont.	Pr.Hab.	Future	Past	Row Totals
Pr.Cont.	<u>26</u>	59	3	89	177
Pr.Hab.	7	<u>17</u>	1	31	56
Future	6	21	<u>60</u>	32	119
Past	10	38	0	<u>115</u>	163
Column Totals	49	135	64	267	515

In Table 6.9 the diagonal entries underlined allow us to see the accuracy with which the group as a whole makes use of normal English form to indicate time and aspect reference. No systematic distinctions are made in the present or the past between continuous and habitual activity and it seems that any differences are either random or in free variation. Hence we may combine these categories.

Table 6.10

Form/Reference relations in affirmative sentences, ignoring aspect (Raw Scores)

	<u>Form</u>			Row Totals
	Present	Future	Past	
Present	<u>109</u>	4	120	233
Future	27	<u>60</u>	32	119
Past	48	0	<u>115</u>	163
Column Totals	184	64	267	515

Some interesting relationships appear in Table 6.10 according to whether attention is focused on form or reference.

Focusing on form: present form is more likely to indicate present time (59%) than past (26.1%) or futurity (14.7%). A future form is almost exclusively linked with futurity (93.8%). It never occurs with past reference, but occasionally links with the present. Past form is slightly more likely to refer to the present (44.9%) than to the past (43%) and may, in a substantial minority of cases (12%)

actually have future time references.

This shows some advance on the position reached by the younger children. The older children re-affirm the certainty of future form-future reference relationship. The present form is coming to be linked more closely with present reference (younger group - roughly 50% chance of form-reference accuracy ; older group - nearly 60%) and past form is becoming more closely connected with past reference (younger group - 25% (past) - 75% (present); older group 43% (past) - 45% (present)).

In spite of these improvements and except in the case of overt future-marking it is clear that in the group as a whole very little reliance can be placed on the form of the A/C words.

From the point of view of reference, i.e. what the children were trying to achieve, present time is more likely to be shown by an A/C in the past (51.5%) than the present (46.8%), while futurity is indicated only in half the instances by an A/C with future form. In 23% of cases a present form may be used. In itself this is not serious, since normal English uses a similar form (I am going to Holland next week). More serious is the use of past form to indicate futurity in 26.9% of cases. Pastness is shown mainly (70.1%) by A/C's in past-form. This apparent correct rela-

tionship between form and reference in the past may be spurious since the commonest form of all A/C's is past.

The analysis above focusing on group behaviour gives little information of direct value, although it emphasizes the difficulties inherent in relying on spontaneous data, where assumed reference is based on formal appearance. A more detailed analysis enables us to detect the emergence from an almost exclusive unit-verb system to one of considerable complexity:

Table 6.11

Stages in the development of A/C morphology

Stage 1:    No morphology:    external marker and unit-verb

(a) 73% of younger group

(b) BP, TW, MS, JH, DG, PI (30% of older group)

Transition stage A:    AP, LT, MW (15% of older group)  
                             exhibiting a few forms (possibly  
                             pseudo-time marking)

Stage 2:    Emergent two-fold system

(a) 27% of younger children - distinguish F and P/Pt.

(b) SA, CC, RS, SW (20% of older group) distinguish  
F and P/Pt.

(c) KB (5% of older group) distinguishes Pt. from  
F/P.

Transition stage B:    JC, MB, DP (15% of older group) - showing  
                             mainly a F and P/Pt distinction but with  
                             some signs of further distinction between  
                             Present and Past.

Stage 3: Developed three-fold system with consistent distinction between Present, Future and Past.

SS, AA, FR(?)

The unit-verbs of the children in Stage 1 have been described earlier and abundant examples have been given in this chapter. Several children (in Transition Stage A) appear to be trying to break away from the rigidity of the unit-verb system and make use of various morphological devices but without consistent time or aspect reference. It is probable that these are pseudo-temporal and aspectual forms.

The children in Group 2 seem to have made a distinct advance on those in Group 1 and Transition Stage A and have evolved a two-fold system. For the majority this consists of a rudimentary and partial distinction between on the one hand the future, indicated by will and a fairly heterogeneous set of other forms probably without regular reference and, on the other, a combined class with present/past reference, closely resembling the earlier unit verbs, several of which are also used with future reference.

Table 6.12(a)

An emergent two-fold AA/C system (Future v. common Past/Present)

	<u>Reference</u>	
	<u>Future</u>	<u>Common(Present/Past)</u>
MW	will kick	kick, was kick (P,Pt)
	will smack	
	are watch )	are watch (P)

bite	}		were watch (Pt)
give	}	Possible	bite (P, Pt)
ran	}	residual	go (P, Pt)
said	}	unit verb	give (P)
fell over	}		
climb	}		climb

IT	will be kicked		kicked (P, Pt)
	will be bite		
	pushed	}	pushed (P)
	watched	}	watched (P, Pt)
	is climbed	}	is climbed (Pt)
	is ran away	}	is climb (P)
		Residual	
		unit	
		verbs(?)	

AP	will sack (= smack)	sacked (P, Pt)
	will bite	bite (P, Pt)
	kicking	kicked (P, Pt)
	watch	watched (P, Pt)
	ran - residual unit verb(?)	ran (Pt)

One child, KB, appears to be in a similar stage of development, but contrasting a past with a present/future tense:



Table 6.12(b)

Two-fold contrast (Past v. common Future/Present) in A/C words

	<u>Past</u>	<u>Common (Present/Future)</u>
KB	was smack	smacked (P )
		is smacking (F)
	was kick	will kick (F)
		kicked (P)
	was watching	are watched (F)
		watched (P)
	climbed )	climbed (P, F)
	came )	came (P)
	is bite )	is bite (F)
		bite (P)

It may be that KB is in a transition stage to a rather higher level, since she also appears to be making some distinction between present and future reference. Futurity is often marked by an auxiliary (will, is, are) whereas present-reference involves a single, largely unchanged A/C word.

This stage may be of great significance developmentally and the first distinction to appear involves not an "internal" vowel change or suffixed -ed as in the normal English simple past, but the additional of a distinct "word": will (be). In the case of KB a similar device is used, in this case was, to indicate pastness, while futurity is indicated by is, are, will.

The persistence of the earlier and more primitive unit-verbs can be clearly seen in these examples, indicating that development is not across the board but piecemeal. Ivimey (1975) noticed a similar form of piecemeal advance in the morphological development of a large sample of normally hearing children. This piecemeal development may be characteristic of many aspects of language acquisition.

A rather similar level has been reached by those children in Transition Stage B, of whom only one example will be given.

Table 6.13

A/C words in transition stage B

	<u>Reference</u>		
	<u>Present</u>	<u>Future</u>	<u>Past</u>
JC	is kicking	will kicking	had been kicking
	is climbing	will be climbing	was climbing
	is watching	will be watching	had been watching
	pulls	will be pulled	
	punched	will punched	punched
	give	will give	has given
			had given
	is walker	is walking	

There seems to be no clear and regular relation between the different forms in the past or between will and will be in the future.

DP shows a rather different three-fold distinction between

Present	=	V
Future	=	<u>will</u> v
Past	=	<u>Ved</u>

but there are several residual unit verbs in Ved used with present reference.

MB resembles, in slightly more advanced form, KB with present shown by V, future by will V, will be V, will been V and past by was V, have been V. Once again there are many residual unit verbs, in this case in "present" form.

What marks Transition Stage B off from Stage 2 is the greater confidence with which futurity is handled: the beginnings visible in Stage 2 appear to be developing towards greater stability. In parallel, although there is still persistence of unit-verbs, present reference appears to be splitting off from past.

The final and most developed stage in this sample of children is reached by three children as shown in Table 6.14.

Table 6.14

A developed A/C triple system

	<u>Reference</u>		
	<u>Present</u>	<u>Future</u>	<u>Past</u>
FR	jumped	will jumped	had jumped
	is biting	will bite	has been biting
	is kicking	will kicking	has been kick
	is watching	are watching	watch
	{ is going to smack	might smack	smack
	{ smack		
	is climbing	might climbing	is climbing
SS	jump	will jump	jumped
	smack	will be smack	did smack
	is kicking	will kicking	was kicked
	is climb	will climb	was climb
	is watching	will watch	was watched
	bite	will bite	was bited
	give		gave
AA	can jumping	will be jump	jumped
	is smacking	will be smack	smacked
	is kicking	will be kicking	was kicked
	is climbing	will be climbing	was climbed
	watching	are watching	has watched
	bite	will be bite	was bite
	{ giving		give
	{ is gave		

It is clear that the unit-verb has almost disappeared in this group although it is possible that the -ing ending for FR is

a residual, as it may be for AA.

These examples enable us to fill out the developmental outlines given in Table 6.11. In Stage 1 the action-core functions as a unit-verb. Any changes that occur are largely random and it is impossible to detect any clear relationship between form and reference. Distinctions of time and aspect are made, where they are made at all, by adding either initially or finally (more rarely within the sentence) some time-word. This is the external-marker and unit-verb system described by Ivimey in his original paper (Ivimey, 1976(a)). From this non-morphological stage there develops a two-fold distinction, in which the children appear to distinguish between either

- (a) future form with future reference and a common form with past and present reference, or
- (b) past form with largely past reference and a common form with present and future reference.

In this group of children (a) appears to be more common but a feature that is found in both groups is the use of a separate word to indicate the marked, as opposed to the unmarked, form. The unmarked form appears to be very closely related to the more primitive unit-verb.

Later still the common form itself separates and we find a more developed triple system in which past, present

and future time appear to be distinguished with some consistency. It is impossible to detect in the elicited data any finer division between near and remote time in either future or past, nor can one see any clear evidence of aspect differences. It may be that these will not appear until much later stages of development. A number of different combinations of normal English auxiliaries are used but apparently without regular relationship to aspect or fine time distinctions. It is possible that these elements, apparently in free variation, are pseudo-elements, as discussed below, p. 320

The level of development reached by each child in A/C words allow us to make an interesting comparison with the developmental level reached in sentence complexity (Table 6.3, above). In order to do this the data in Table 6.11 have been re-grouped (Table 6.15).

Table 6.15

A/C word developmental stages

Group 4: No morphology (= Stage 1)

BP PI TW MS JH DG

Group 3: Transition Stage A

AP LT MW

Group 2: Dual system (Stage 2 and Transition Stage B)

SA CC RS SW KB JC MB DP

Group 1: Triple system (Stage 3)

SS AA FR

In both Tables 6.3 and 6.15 the lower the group the more primitive the system. These are compared in Table 6.16.

Table 6.16

Comparison between developmental levels attained in A/C -

<u>word and sentence complexity</u>	<u>Level</u>	
<u>Child</u>	<u>Sentence complexity</u>	<u>A/C word</u>
AA	6	1
KB	6	2
AP	6	3
MB	6	2
FR	6	1
MS	5	4
JH	5	4
TW	5	4
JC	5	2
RS	5	2
CC	4	2
DG	4	4
SS	4	1
SW	3	2
PI	3	4
DP	3	2
LT	2	3
MW	2	3
BP	2	4
SA	1	2

These differences were tested statistically, using the Wilcoxon Matched-Pairs Signed Ranks test (Siegel, op.cit.) under the null hypothesis that there was no significant difference between levels reached in complexity of sentence and action-core words. This test gives a T value of 6, with N = 20, allowing us to reject the null hypothesis at

$p < .01$ . This result may be interpreted as follows: differences of this magnitude would occur as a result of random forces in fewer than one case in a hundred. A probability figure of this size ( $p < .01$ ) would be accepted in most behavioural research as evidence that some non-random "force" was in operation.

It is probable that not too great reliance should be placed on the actual figures in Tables 6.3, 6.11 and 6.15 since the data are by no means exhaustive and because the number of subjects involved is rather small. However, if even the most conservative interpretation were accepted it is clear that there is a well-marked tendency for children who have reached a more advanced level in the communication of fine detail in A/C words to use mainly rather shorter sentence structures. This may seem paradoxical since both increased structural complexity, as defined above, and improved level of time-signalling accuracy in A/C words will contribute to advances in the communication of information, yet we find children advancing in one area and not in the other.

There is no theoretical reason why advances in conceptual growth should advance evenly across the field, but if reasons have to be found then two seem likely:-

- (a) The children with greater knowledge of their syntax may also possess greater insight into their own limitations and therefore confine



themselves to rather simpler sentence structures. This "fools rush in where angels fear to tread"<sup>behaviour</sup>/(in which foolishness should be equated with simplicity and lack of knowledge) certainly seems to apply in the case of many second-language learners. Those who know least are often the most adventurous in communicating.

- (b) An alternative explanation may reflect the phenomenon not uncommon in other aspects of language development: that advance in one area may result in an apparent "regression" in another. Waterson has shown this in the case of child phonology (Waterson, 1970 ).

#### The mechanical treatment of A/C words

The elicited sample contained a majority of normal English weak verb forms, with past time reference indicated by -ed. Since the aim was to obtain a language sample in which regularities could be detected, this was inevitable. The sample also examined usage of 4 non-weak forms: bite, go, sleep, fall. It has been shown that, for the most part, these were treated like any other A/C word: if these latter are represented by unit-verbs, then so are these 4 non-weak forms. For many children any vowel changes in these appear to be treated as in free variation.

In order to test verb usage in a rather different setting (as part of the validation process) and to sample additional verbs, a "mechanical" test of ability to change verbs was administered. Each child was provided with a booklet with matching sentences on opposite pages. On the left-hand page a sentence with the verb in the present tense was given:

Peter jumps over the river

Opposite was an incomplete sentence in which the verb was omitted, but to which a clear past time-marker was added:-

Last week Peter \_\_\_\_\_ over the river

The task, for the child, was to complete the second sentence. This test was administered by the class teachers, who were asked to give as much explanation as they felt necessary before the test, but without using the actual verbs in the test.

Only commonly occurring verbs were used in the booklet, some of which also occurred in the elicited part of the investigation:

weak verbs

jumps

crawls

kicks

non-weak verbs

comes falls say

writes give

brings bite

buys go

Cut was also used in order to test for possible overgeneralization of the weak verb rule.

The demands made on the children by this test were rather different from those made by the elicitation test. In the latter the children had many more things to do: retrieve from their memory stores the appropriate lexical items, construct sentences, make any structural changes requested by the examiner, remember how to spell the words and so on. In the mechanical test the task was rather simpler, involving merely recognition of the verb and recalling its "past" form.

The differences are rather similar to those faced by second language learners confronted, on the one hand, by a free composition and on the other by a typical grammar book exercise of the "Ecrivez au passé composé" type. It is usual for performance on the second to be more accurate than on the first of these tasks, and one would expect a differential "success" rate also for the deaf in the two situations.

An additional difference is that deaf children are more accustomed to the mechanical type of test in their daily schooling than to the elicited sampling method. It is not uncommon for classrooms to contain wall charts of formal paradigms.

In processing the results say and cut were excluded. The former was used "correctly" in all cases and also appears frequently in both the elicited and spontaneous samples. It is very rare for it to appear as anything other than said and it is highly probable that it is a unit-verb. Similarly cut appeared either as cut, in which case no decision can be reached as to whether it was functioning as a unit verb or had merely been copied unchanged from the stimulus sentence. In some cases it does appear as cutted, suggesting overgeneralisation of the -ed form. The similar form put appears fairly frequently in the elicited data in place of pull and push, and there appears to be a unit verb.

The responses of two children had to be excluded from consideration for a rather different reason: RS, because he was absent when the mechanical test was administered, and TW who presents some interesting problems. In the elicited sample every verb he used ended in -ed, whatever the time reference. In contrast, in the mechanical test, he merely copied the verb as it stood in the stimulus sentences. His level of linguistic development is very low and it may be that he cannot overcome the perceptual "pull" of any stimulus, whether it originates in himself or is external in origin.

The mechanically obtained data allow us to make two comparisons:-

(1) The ability to handle correctly weak and non-weak  
English verbs

In the group as a whole (but excluding RS and TW) weak verbs appear in correct past form 74% of the time. This figure contrasts strongly with the level of correctness for non-weak verbs (49%). This difference yields a z-value (Edwards 1970) of 1.308,  $p < .09$  which is statistically non-significant.

Such a comparison, based on normal English usage, may be rather too rigorous, since it fails to recognise "near misses" - non-weak verbs in which the correct vowel change occurs but which retain the singular number marker, -s, resulting in forms like writes, fells. Since it is clear that this group of verbs is still being learned it may be that this error is transient and should be ignored. If this is done the level of "correctness" (or more accurately of approximate correctness) in non-weak verbs rises to 57% although the difference between weak and non-weak forms is of course still statistically insignificant.

However, neither of these figures gives a clear picture of the real differences in ability to handle past reference in verbs. A considerable number of apparently "correct" forms in the mechanical test occur as unit verbs in the elicited corpus. Taking these into account the proportions "correct" fall to:-

weak verbs:	68%
non-weak verbs:	38%

In this case the difference is statistically significant, ( $z = 1.7, p < .05$ ).

An analysis of this kind seems to yield indeterminate results, yet it clearly demonstrates again the weakness inherent in basing any analysis on the appearance of items in deaf language. Any conclusions based on mechanical tests may lead to a gross overestimate of the ability of the children. If the estimates of correctness, taking unit verb usage into account, is compared with that based on form alone, the differences are statistically significant ( $\chi^2 = 6.033$  with 2 d.f.,  $p < .05$ ). This result gives a measure of the size of error that would result in relying purely on mechanical tests.<sup>x</sup>

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<sup>x</sup> Since teachers of the deaf use these mechanical tests and similar exercises in their teaching, these results may explain, to some extent, the discrepant views of teachers who often feel that their pupils do know quite a lot of English, and of employers, social workers and the deaf themselves who often feel that deaf children are inadequately prepared for "oral" living by the schools.

(2) A comparison between elicited and mechanically produced forms

Since the mechanical test contained some normal English verbs that also occur as A/C words in the elicitation test it is possible to compare performance on these two different tasks. Overall, performance in the tests is similar in 64.6% of cases, although if unit-verbs are excluded the figure drops to 45%. These figures are rather low, indicating correlations of approximately + 0.80 and + 0.67. However they do have some value, for the reasons discussed earlier, i.e. that one would expect performance in the mechanical test to be more "correct" than in the elicited sample. A detailed comparison is made in Table 6.17, where a number of processes can be seen in operation:

Table 6.17

Comparison between elicited and mechanical levels of accuracy in past-tense formation

Key: R = regularised form

M = improvement in mechanical test

E = improvement in elicited test.

<u>Child</u>	<u>Correct Prediction</u> <u>(= identity)</u>	<u>Unit verbs</u>	<u>elicited form</u>	<u>mechanical form</u>	<u>Notes</u>	
AA	2/5	-	was bite was fell was kicked	bited fell kick	R	M M
SA	3/6	2	was kick bite fells went	kicked bited fells going	R	M M E

KE	2/4	1	fall is bite	felled bited	R R	M M
MB	1/3	-	was jump kick	jumping kicking	(see below)	
GC	3/5	2	are kick was bite	kicked bite		M
JC	2/2	1?				
DG	4/5	2	bited	bat	R	E
JH	2/5	-	is jumped fell gave	jumps falls give		E E
PI	2/5	-	kick fall down bit	kicked fell bited	R	M M E
			(possible spelling error in E)			
AP	3/4	3	bite	bited	R	M
BP	4/4	4				
DP	3/4		bite	bates		
FR	3/5	-	has been kick has been bite	kicked bites		EM
MS	3/4	2	bited	bited		
SS	2/4	-	was kicked was bited	kicked bited	R	M M
LT	3/5	2	gave kicked	gives kick		E E
MW	2/4	1	was kick fall down	kicked fells		M M
SW	4/5	2	bite	bited	R	M

(i) As predicted, responses to the mechanical test are more "accurate" than those in the elicited sample. In the case of eight children no clear decision can be made, for a number of reasons: absence, exclusive use of unit-verbs in the elicited corpus,



because only one case occurred where comparison was possible or, where two cases were found they showed improvement in opposite directions. Only two children (JH and LT) showed more correct usage in E than M. In contrast seven children show a clear improvement in M.

(ii) MB's responses to the mechanical test contain some inexplicable anomalies, including 7/18 past forms ending in - ing.

(iii) One powerful process appears to be that of regularisation, indicated by R in the table. In most cases this involves an overgeneralisation of the normal English weak ending, -ed, to other verbs. This is seen mainly in the case of bite, which becomes bited in 10 cases (55%), but can also be seen in felled (occurring once), cutted (six times), writed or wroted (3 cases) and bringed (once). These examples are found mainly in the mechanical test where children had little to do except produce the correct form of a single word. Examples are also found in the elicited data where the following forms occur:

bited and was bited (DG, MS)

slepped (DG, MS), is putted (AP)

It appears that, even though the form -ed is applied incorrectly, where it is applied a rather similar process of overgeneralisation is found in the deaf as in young hearing children.

The mechanical test was given also to a group of young, normally hearing children attending a school on the S.E. outskirts of London. The average reading age of the deaf children (as measured in the Southgate II Test) was 7, 9 years, with scores ranging from 7, 3 to 8, 4. The hearing school was selected at random and the Headmaster was asked to select a class of children aged 7 with average ability and a reading age of about 7 years. The hearing class included 31 children, of whom one was a Chinese with poor English ability and three children were unable to read adequately enough for the test. In the case of these 4 children the class teacher carried out the test orally and individually. These children were allowed to complete the test to prevent disappointment but their results are excluded from Table 6.18.

Table 6.18

Comparison of responses to mechanical test of English  
past-tense verb formation

Note: in this table the most optimistic values are given  
to the deaf samples. Form of verbs is taken as  
correct and no correction is made for unit-verb status.

<u>Stimulus</u>	<u>% correct</u>	
	<u>Hearing</u>	<u>Deaf</u>
weak-verbs:		
jumps	74	61
kick	85	78
crawls	74	78
(mean:	78	72)
non-weak verbs:		
comes	78	72
give	82	78
says	78	83
go	93	61
bites	74	6
cut	92	56
writes	37	61
brings	52	39
buys	67	61
(mean:	73	57)

is	100	89
am	96	56
are	82	56
(mean:	93	67)
have	93	83
has	93	67
(mean:	93	75)

From the table it seems that deaf and hearing children, aged 13 and 7 respectively, can handle the past tenses of verbs almost equally well in the case of weak-verbs but less well in the case of strong and mixed verbs, be and have. In fact, the differences between mean values reached in each of these categories (raw scores) are statistically very highly significant. However, it should be remembered that the deaf do not consistently use past-form to indicate past-time, and when this fact is taken into account, even more extreme values emerge. In Table 6.19 are given overall values of correct scores for the two categories weak and non-weak, with the scores of the deaf corrected for unit-verb status (i.e. where an A/C is a unit-verb with past form it cannot be counted as an accurate response in this sort of test):

Table 6.19

Comparison of responses to mechanical test (corrected for unit-verb status)

	% correct	
	<u>hearing</u>	<u>deaf</u>
<u>weak verbs</u>	69	68
<u>non-weak verbs</u>	76	38

The raw scores underlying these values give  $\chi^2 = 117.27$  with 1 d.f. The probability of such values occurring by chance is so remote that limiting values are not given in statistical tables. We see, therefore, that there is a significant difference between the two groups and this lies in the differing ability of the groups to cope with non-weak verbs. When we examine the sorts of error made, this finding is reinforced. Table 6.20 allows us to compare some typical errors made by the two groups.

Table 6.20

Selected errors occurring in the mechanical test

	%	
<u>Error form</u>	<u>Hearing</u>	<u>Deaf</u>
cutted	6	33
buyed	3	0
failed	3	0
bited	0	44

writed	0	11
wroted	0	5
felled	0	1

Table 6.20 shows that errors of the overgeneralisation sort appear more frequently in the answers of the deaf children. This suggests that the deaf thirteen-year-olds may be at a rather earlier stage of development than the hearing seven-year-olds.

#### Transitive and intransitive Action-cores

A number of cards was used to elicit normal English transitive and intransitive verbs. For the most part the deaf children distinguish between these, the former being followed by a direct object phrase (either immediately or after an indirect object), the latter by a prepositional phrase or standing alone.

To the class of transitives must be added Deafish over and present, if these are true A/C's. It is not uncommon to find some English transitives appearing in a Deafish S-V structure:

Yesterday he kicked

The children watched

It is possible to find similar uses in English, e.g. in the first case in reply to What did he do? and in the second as part of a large sequence: Daddy mended the bicycle while the

children watched, but their appearance as objectless A/C's in simple statements is, at least in part, anomalous and may indicate some uncertainty in their proper usage. This sort of structure is, however, very subordinate in the data as a whole.

Some other A/C's are used both transitively and intransitively. Thus climb the tree and climb up the tree appear to be interchangeable within the group although individual children tend to confine themselves to one or the other. Of course, if climb up is taken as a unit with roughly unitary equivalence to climb then they may both be treated as transitive. Jump (the river) and jump over the river are rather similar.

Two clear cases of confusion seem to occur. Most of the children use smack as in English taking a direct object, but in a small number of cases it occurs without any object and with or without a prepositional phrase:

<u>Daddy smacked on the face</u> (F )	TW
<u>Daddy was smacked everyday</u> (P )	LT

In the second example there was no suggestion of passivity, was being intrusive.

This use of on may indicate the need for indicating directionality in A/C's of movement, similar to the use of to with kick:

The two girls kick to little boy (P )      MW

This may be vestigial from an earlier stage here: the use of kick to was more common in Ivimey and Lachterman's younger sample.

Omissions of direct object, similar to that by TW above can be seen in:

John and Mary watched on the television (P )      AP

In general intransitive verbs, where they are followed by a context nominal phrase take a preposition, but a very small number did not:

<u>ran the river</u>	(DP)
<u>threw the garden</u>	(DG)
<u>fall the stone</u>	(KP)
<u>be rude her father</u>	(RS)

Sleep seems to present difficulties in this way:

<u>sleaped the bed</u>	(DG)
<u>sleep his bed</u>	(JH)
<u>slept the bed</u>	(KB)

Although we can see a number of prepositional misusages, as in the quoted examples they form only a small proportion and in general the older group has made a considerable advance on the younger.



## II Nominal Phrases

It is possible to discriminate a class of words contrasting with the action core words, having different privileges of occurrence and typically preceding or following the A/C. Morphological changes, where they occur, are generally similar to those in normal English plurals and genitives. The majority of these elements can be preceded by the, especially in pre-A/C position. Post-A/C forms may take the, or  $\emptyset$ . A occurs very rarely and then, for the most part, only in post A/C position.

In form and function these elements closely resemble normal English nouns and it is probable that they have quasi-English class naming functions, although it is possible that some of them may have proper-noun status, referring to a specific object. For example, the author once introduced a graduated glass measuring jug to a class of 10-year-old deaf children and used the word "jug". The children rejected this and one produced a metal jug used in the dining hall, saying:

Jug (holding the metal one up) this not jug  
(pointing to the glass one).

In this case "jug" seems not to be a label for a class of objects marked by similar semantic features, but for a single object or a set restricted to those almost-identical objects used in the school dining hall.

It is impossible to tell, from the evidence of the elicited data, whether or to what extent the reference of English words differs in Deafish, but the possibility should be constantly born in mind: use of a word must not be taken as indicating identical or even near-equivalent semantic structures for normally hearing and deaf children.

However, in spite of this, we may tentatively borrow the English category name for these items and label them nouns. The nouns are for most, probably all, the children interchangeable with proper names and pronouns, although, as will be shown later, the substitutability of pro-forms may be rather different from that of normal English.

1. Nominal markers

Most nouns are preceded by the, but this does not appear to have normal English deictic or determining functions. It seems to operate largely for all the children, and apparently exclusively for some, as a relatively meaningless noun marker especially for pre-verbal nouns. It is possible that, in these cases, it may function as some sort of inter-sentence juncture, replacing the intonation patterns more common in normal spoken language.

Of the children tested, nine use no other determiner, although it may be omitted in object nominals. One child appears to be in an intermediate stage, while of the ten children who use a (in general in only two or three instances at most), this form does not seem to have any clear indefinite

implications, but indicates object or complement status.

In this case it often contrasts with a dative, whether this is marked or not:

- FR:            The boy gave to the girl a big present    (P )  
                  The girl is giving the dog a bone        (P )
- SW:            David gave a box to Jane        (P )  
                  Tina gave a bone to dog        (P )
- JC:            Her mother gave the girl a present    (P )
- DP:            The girl gave a present Mrs. Denise

One child (MW) used some in a similar way:

- The girl gave some present the boy    (P )  
Mummy gave some £1 to girl        (P )  
The girl give to the dog some bone    (F )

(Present and bone were clearly singular in the eliciting pictures).

Since neither thenor a appear to have any clear deictic function it is probably better, at least provisionally, to avoid normal English terminology and, instead, to develop a new class name for these items: nominal marker (Nom). The appears to be largely confined to subject position (Nom<sub>s</sub>) while in most cases a may function in object phrases (Nom<sub>o</sub>) but with strong contrastive (i.e. with indirect object) implications. For some children some may be in free syntactic variation with a.

## 2. Nouns

Although, as discussed above, there are good reasons for accepting this class name, the morphological implications of normal English nominals are not always present in Deafish. Seven children make no distinction for number at all: their nouns appear as unchanging units. Some nouns take a final s, but every example is incorrect in terms of the eliciting stimuli. For example CC uses:

the two 13 year old girl

She also uses girl for girls on two other occasions and the bones, for a clearly depicted single bone. Five children seem to be in an intermediate stage, achieving success in some cases. Thus MS correctly distinguishes between singular and plural in regular nouns but confuses man and men. This could be taken as an early stage of development but since the same child also confuses give and gave it may be better to see him as ignoring intra-word vowel changes, treating them as in free-variation.

MB writes the two girl, but uses a correct plural in the boy legs. This contrast is not uncommon and it may be that use of a numeral to indicate plurality may obviate the need, at this stage of development in Deafish, for further redundant marking.

Mass and count nouns

The deaf children make no clear distinction between mass and count nouns. Since such a distinction appears mainly in normal English in the presence or absence of a plural marker, this result may merely reflect the general lack of number distinction, or it may reflect a weakness in the eliciting stimuli. Only one card was used bearing a possible mass-noun stimulus: a woman giving money to a girl. On the note that was being handed over was a clear £ sign and this may have dominated the perceptual field for the children. No child used the word money and, in this sense, the elicitor failed in its intention. Most of the children used a phrase like £1, £5 and thus avoided, probably unintentionally, the issue. Four of the children however, used the value with a "mass" marker :-

<u>some £5</u>	(CC)
<u>a 1 pound</u>	(MB, JC, KB)

This use of some was repeated with other count nouns but no plural marking:-

<u>some present</u>	(CC)
<u>some bone</u>	(MB, MS, TW)

In each case the object was singular and although the use of some was, in terms of English, wrong, it may indicate a hesitating and groping movement in the direction of a mass/count

distinction in nouns. Alternatively it may be that this use of some represents a pseudo-determiner<sup>form</sup>/, noted in many other aspects.

The evidence that might enable us to decide between these alternatives is unclear and this lack of clarity is rendered worse in that the children who use some in this apparently deviant way do not elsewhere distinguish clearly between singular and plural nouns. For one child at least a sum of money is treated as equivalent to other items:-

a one pound

a present

a bone

(JC)

which might be taken as weak evidence for the position that, in the group as a whole, there is no clear differentiation between mass and count nouns, at least as indicated by use of English determiners.

It may be argued that a phrase like a one pound derives from omission of the word note. The dangers of adding items to experimental data have already been discussed and, for the present, it is probably wiser to leave the matter as it stands. Failure of the eliciting instrument to provide data on this point is a weakness that must be remedied in future work.

Two children used the word note (AA, DG) in this context but DG omitted the article:-

Mummy give you pound note

### Possession

Although the eliciting stimuli did not directly call for indications of possession a majority of the children attempted to use it, in contrast with the younger children in whose protocols it occurs in one instance only (9% of the total). This child showed possession by juxtaposition:-

The girl kicked knee and bottom boy

In contrast, thirteen of the older children (65%) attempted to show possession, indicating increased linguistic (and possibly intellectual) sophistication. Of these thirteen, five (25% of the whole group) used a similar structure, indicating possession by juxtaposition, e.g.

the boy legs	(MB)	
the postman trousers	(MB, MW)	
the boy face	(MW)	<sup>x</sup> note

---

x It may be that this technique represents the normal English genitive with "apostrophe s", but with s omitted, either because it is perceptually unclear (as many experienced workers would claim, e.g. Denmark, op.cit.) or because the necessary conceptual structure has not yet been acquired (Ivimey, 1976(b)).

Seven children do make use of the normal "apostrophe s" structure. Two of them use it exclusively, the rest alongside a possessive pronoun structure.

Two of these five children also made use of a rather different technique: possessive pronoun and noun:-

the boy legs      and  
his face                              (BP)

While DG seems to be transitional toward this stage:-

the man leg      and  
his face the boy

In this last example it seems as though DG felt that his face was insufficiently precise, or that she could not correctly produce the genitive of the noun: boy's face. A third possibility is that this was an anomalous sentence for DG. Elsewhere it is clear that in the phrase his face the boy indicates a conjoined structure:-

Tomorrow the man smack his face the boy sad.

Another child, JH, shows apparent confusion between personal pronouns and adjectives:-

Daddy smack him face

An alternative explanation is that the child was attempting to use a prepositional phrase but has omitted the preposition (e.g. Daddy smack him on the face).



MS indicated possession exclusively by means of pronouns:

his hair, his face, his leg.

and, in doing this loses some expressive precision. Utilisation of a pronoun in the initial sentence of a sequence leaves the exact reference unknown.

MB: Her father smack his face

CC: His father smack his son's face

(Both of these sentences were the first of sequences)

The hearing controls of Ivimey and Lachterman produced normal English structures: on first mention, the referents were specified. Thereafter they tended to be shown by pronouns. Three or four of the more sophisticated older deaf children also achieved this:-

SW 1st occurrence The boy was sad because Daddy was angry (now)

2nd occurrence Daddy smacked his face (now)

SS  
(a) 1st occurrence Today two girl is kicking the boy's leg

2nd occurrence Everyday two girl is kicking him

- (b) 1st occurrence Father did smack the boy's face (P )  
2nd occurrence He did play about (P )

AA The big girl is kicking small girl's back and other  
big girl is kicking her leg (P )

- 1st occurrence A little boy is climbing the tree<sup>x</sup>  
2nd occurrence Before he was climbed the tree

In some cases there was confusion in pronominal usage very similar to that of young hearing children:-

His daddy smacked your face (now) SA

We see, therefore, a gradual movement towards a more integrated style. The younger deaf children repeated noun phrases in full in almost all cases which may be partly responsible for the reported discontinuity in deaf written language, e.g. by the Heiders (op.cit.). We will see later that this tendency to repeat nominals is a feature of the style of spontaneously produced language of deaf children. In contrast, a large minority of the older deaf children were moving towards a more integrated style, even in the disjointed elicited language, without, however, reaching the level of fluency and skill of the hearing control sample.

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x Note: this was one of the very rare examples of a occurring in sentence initial or subject noun phrase position.

Dative phrases

Normal English indicates the recipient of an act of transfer in two ways:-

- (i) direct object + to + indirect object
- (ii) indirect object + direct object.

Three of the deaf sample (SA, BP, CC) used both structures accurately, but the others all show varying degrees of uncertainty, usually in the presence or absence of the preposition.

A large group (seven children, 35% of the total) merely juxtapose the two nominal phrases. For three of these children (AP, DP, MS) this is clearly "wrong" in normal English terms:-

<u>The girl give the present the girl</u>	(AP)
<u>The girl give the bone the dog</u>	(AP)
<u>Mummy give £1 the girl</u>	(AP)

In the case of the remaining four children (KB, JC, MB, RS) the pattern appears normatively correct:-

<u>I give you a present</u>	(MB)
<u>I give the dog some bone</u>	(MB)
<u>Her mother gave a girl one pound</u>	(RS)

(These examples show clearly the use of a/some as contrasting with an IO phrase)

Of these four children, two (JC, MB) use juxtaposition to indicate possession and it may be that they are using a similar device in this context, the apparent "correctness" being spurious and fortuitous. KB uses no possessives so we can reach no certain conclusion about her. In contrast RS uses both the "apostrophe s" and possessive pronouns in appropriate situations, so we may be reasonably sure that for him, both datives are equally likely to be correct.

Five children show considerable confusion in their use of datives. Since in many cases they are clearly "wrong", little confidence can be placed in those examples that are "right": emplacement of DO and IO and use of the preposition to seem to be rather random, and it is the nature of randomness that both "hits" and "misses" will occur:-

AA: Mother gave to him present  
Mother gave to her £1 note  
Girl's Auntie give a girls present

SS: The lady gave her £1 (P)  
Mother gave the present to her  
Mother gave to dog a bone

LT: Mother gave to the girl pound  
The man gave a bone a dog

FR: The boy give to the girl a big present  
The girl give the dog a bone

MW: The girl give some present the boy  
Mummy gave some 1£ to girl (P )  
The girl give to the dog some bone

We see, therefore, that among this group of children there seems to be a great deal of confusion: many recognise the importance of the dative preposition and also that there are two possible ways of indicating the recipient of a transfer but they tend very often to confuse these two separate processes. From the data available it is not certain whether this indicates a random behaviour or a true transitional stage of development towards normal English usage.

Another interesting group of children use the unusual (in this context) preposition for and with:

JH: The girl gave present for her (P)  
Mother gave one pound for the girl (P)  
The girl gave the bone for the dog (P)

TW: The girl give some pound with dog  
The boy present the box with girl

PI and DG also use examples of for but not so consistently. In one sense use of for could be assumed to be almost correct, and several teachers of the deaf whose opinion was sought, when asked to interpret these sentences did so by assuming a missing element:-

Mother gave £1 (to someone) for the girl

However this explanation is unlikely, since the stimulus cards show (1) mother or a woman giving the money to a girl and (2) a boy giving a present to a girl. In neither case is there any suggestion that a third person is involved and none of the hearing control group of Ivimey and Lachterman indicated this as a possibility. More extremely - it is unlikely that anyone would give one dog a bone for transmission to another: canine unselfishness does not normally reach this level. A final point is that this explanation cannot be used in the case of with.

It is more probable that we find here a case of pseudo-prepositional usage. The children are aware that these forms exist and it is extremely likely that they have encountered them in close juxtaposition with verbs of giving, but they seem not yet to have isolated the correct usage. Thus sentences like:-

Mummy gave me a present for Christmas

I will give you a letter for your parents

are by no means uncommon in normal speech. In the second case the implication of the prepositional phrase is that the child will give the letter to his parents. In this case for has strong dative implications as it does in:-

This is for you.

accompanying the giving of an object. This sort of confusion or instability in adult usage has been shown, in the case of normal English noun and verb morphological changes to delay acquisition (Ivimey, 1975) and it may be that a similar explanation is valid here. This argument does not explain the anomalous use of with, which may arise from the implications that this word has of personal contiguity.

#### Use of adjectives

Several earlier writers have commented on the infrequent use of modifiers and qualifiers in the language of deaf children: for these, categories of noun-like elements appear to be used in an absolute sense with little or no attempt at achieving precise distinctions through use of adjectives.

In the present sample this occurs in twelve cases (60%): nominal phrases consist, for these children, of the nominal marker the and a noun. Of the remaining children,

five (25% of the total) do modify their nominals but only to a limited degree. Examples can be found only once or twice in the whole corpus of a single child, and then usually singly.

Only three children (15%) use adjectives relatively frequently:-

RS     The silly boy climbed a old tree     (P)  
       The naughty girl was kicked a boy's leg     (P)

(In these examples can be detected other features already described: unit verbs, use of a in NP<sub>object</sub> position and incorrect number marking: girl should have been plural).

A lovely baby slept in the small bed     (Pt)  
A nice boy went to school     (Pt)

(The use of a here is rare: these are only three examples of its occurrence in subject position in the whole corpus).

CC     The two thirteen year old girl are kick the  
       little boy     (P, Pt)  
       The baby boy sleep in the bed     (P )

AA attempts to achieve some relatively fine distinctions through use of contrasting adjectives:-

The big girl is kicking small girl's back and other  
big girl is kicking her leg.



### Context phrases

These are closely linked to the nominal phrases discussed above as they usually consist of a preposition and nominal group. A few cases appear without a preposition and it has been argued, in the case of younger deaf children, that this reflects conceptual immaturity (Ivimey, 1977(c)): the easily demonstrable directional and locational forms appear quite early, before the appearance of to in datives. Similarly dative to often appears before other prepositions, notably for, with, by, which are less early demonstrated. Confusion in the use of for and with have already been discussed.

The stimulus pictures used in the test were used to elicit prepositions in a number of different environments:-

- (i) dative to (already discussed)
- (ii) over (falling over a stone)
- (iii) over (jumping over a river)
- (iv) directional (to school)
- (v) locational (in bed)

In addition a more mechanical test was given, as in the case of verbs. This consisted of a booklet containing a series of pictures and a number of incomplete sentences to be completed appropriately.

<u>Picture</u>	<u>Sentence</u>	<u>Target</u>
1. Ball on table	The ball is _____ on the table	
2. Child putting doll in box	Mary is putting the doll _____ in/into the box	
3. Box in front of T.V. set (Both on table)	The box is _____ in front of _____ The T.V. is _____ behind _____	
4. Boy standing near a tree	Tom is standing _____ near _____	
5. Aeroplane flying over a ship	The aeroplane is flying _____ over/above The ship is sailing _____ under/beneath	
6. Toys in a box	The toys are _____ in	
7. Cat sitting under a table	The cat is _____ under	
8. Boy walking to school	Tom is _____ to	
9. Pen in hand, resting on a book	I can write _____ a pen with	

This test is rather easier than the elicitation task. In the latter the children must perform a number of acts simultaneously: interpret the stimulus picture and command, construct a sentence, select the appropriate lexical items, recall their spelling and write them down. In the mechanical test the problems reduce to those of recognition and recall.

The earlier findings of Ivimey and Lachterman are supported in respect of differential use of the preposition to in directional and dative settings. Five children used the dative IO + DO sequence where to is inappropriate and no decision can be reached in their case. Of the remaining

fifteen children, twelve use to in directional phrases and only three in datives, a difference that is statistically significant ( $\chi^2 = 5.4$  with 1df,  $.05 < p < .02$ ).

. In general the children make use in the elicited samples of directional to and in together with a very restricted range of locational forms: on, under, near, by . The mechanical test reveals that these elicited prepositions reflect only a very crude spatial-marking system. Opportunities occurred for use of in front of and behind, but the majority of children used the less precise superordinate concept of near, while many of the children avoided any attempt at indicating the spatial relationship between the box and television set. Instead, each object was treated in isolation and described as on the table. The actual words used can be seen in Table 6.21. Some words clearly show some relationship, usually of the superordinate type while others were definitely "wrong" (off, over, front of for behind, between).

Table 6.21

Expressions used by the deaf children for in front of and behind

		<u>Target</u> (Nos. of examples)		<u>Notes</u>
		<u>in front of</u>	<u>Behind</u>	
	Ø or incorrect	1	4	
<u>Usage</u>	on	6	7	
	near/by	9	5	
	on + near/by	2	2	
	attempt at			
	"correct" form	2	1	front, front of, hilded back
	correct	0	1	

The data in Table 6.21 show the children in different stages of development. In the case of in front 30% of the children treated the objects as isolated. 45% tried to bring out some aspects of the relationship, using near or by while only two children (10%) attempted the correct form. A rather similar pattern emerges with behind.

This may indicate merely the use of a set of crude spatial parameters, as mentioned above, but may also reflect a rather more fundamental conceptual immaturity. One stimulus was designed to detect use of a preposition, under, in relation to a fixed datum point (The cat is under the chair), while a second was used to detect use of under and over of two objects in relation to each other. Results are shown in Table 6.22.

Table 6.22

Expressions used by the deaf children for over and under

		<u>Target</u>		
		<u>'plane over ship</u>	<u>ship under plane</u>	<u>cat under chair</u>
Ø		3	3	
over		9	2	1
under		1	1	18
used	in (the sea)	3	3	
up (the sky)		3		
on (the sea)			8	
by on			1	
near			1	1
in/near by		1	1	1

Thus although all but two children knew under and used it in relation to the chair, only one used it to refer to the aeroplane/ship relation. Nine used over correctly in this situation, but then failed to give its reciprocal. Apparently, having used the ship as the datum point for the aeroplane they were then unable to reverse the situation and use the aeroplane as the datum point for the ship. It is possible that some children did not fully realise the point of the contrast but this seems not to be the sole explanation: 30% of the children, in the case of over and 70% for under again made use of the more general in, up, on that was noted for in front of and behind.

This inability to reverse the directionality of thinking may be closely akin to the use Piaget makes of it (Flavell, 1963 ) and that appears, in his model, only with the beginning of the stage of formal operational thought. In general it is arising from the preceding stage of concrete operational thinking. Lack of reversibility may thus reflect the rather immature set of concepts that the deaf children in the study bring to bear on their interaction with the world. Given their chronological and mental ages many of the children would still undoubtedly be located well within the stage of concrete operations and it may be that immature language skills would further retard their conceptual development. This retardation may also derive from the common teaching habits of many teachers of the deaf who plan lessons involving their pupils placing objects in relation to a limited number of fixed datum points. Reciprocity and variability of reference point rarely seem to be taught explicitly.

Some omissions of non-concrete prepositions can be found in the elicited data. Examples have been given elsewhere in passing and all that is necessary here is to recall them.

One frequent omission (in this sample by 20% of the children) was in after sleep:-

The baby slept the bed (KB)

This omission seems strange since all the children know and use in in other contexts. However, once again, it seems, we find in this example another instance of concreteness of use. In appears to mean, for many of the deaf children inside, i.e. completely enclosed within. The eliciting picture showed a baby sleeping in a bed but with his head protruding. It may be that this caused some confusion. One other child seemed to be faced by a similar problem, which he resolved by using on the bed.

Over also seems to be limited to a very concrete location above meaning, which would account for the tendency to omit it in fall/trip over (a stone) where the meaning differs slightly.

This explanation might apply also to sentences like:-

We played the swing (TW)

The boy ran the path (F) (AP)

Each of these children uses on elsewhere, but presumably with rather static semantic implications. In the first example the children presumably played around as well as on the swing and certainly overlapped it: a contrast to one object placed firmly on top of some other object. In the second case on would be appropriate but less precise than along and it may be that AP is confusing stasis with movement.

In some cases prepositions appear where they would not normally appear in English:-

Daddy smacked on the face (TW)

and it has been suggested that, for some children at least, verbs of physical violence (punch, smack, kick) call for directionally specified objects.

### Names

Names, either singly or in combination appear as alternatives for noun phrases in both subject and object positions.

### Pronouns

These were elicited by stimulus cards used to obtain sentences with be and have. A full range of normal English subject personal pronouns appears to be available for every child. No examples of personal pronouns in object position were specifically elicited but it is probable, given the uncertainty in handling possessive pronouns discussed above, that there would also be some similar uncertainty in this case.

### Summary of micro-structural elements

These elements: nominal, action-core and context phrases have been analysed in detail for the group as a whole, with indications of the levels reached in each by different



children. Dealt with in this way it is difficult to detect whether any consistent patterns or similarities of development can be seen within the group. Table 6.23 attempts to show the levels reached by each child in selected items: action-cores, expression of number in nouns, kinds of structure found in possessive and dative phrases and use of adjectival modifiers. In each case the number shown, reflects a rather rough assessment of attainment, the larger the number the lower the level. Thus in A/C's

- 3 = all or mainly unit verbs
- 2 = emergent dual system
- 1 = triple system of tense marking

Similarly with number-marking, 3 indicates no clear distinction between singular and plural nouns. In contrast, 1 shows consistent and generally accurate (within the limits of the test) number marking. 2 is intermediate and indicates considerable inconsistency. In the case of adjectives, 3 indicates no use at all, 2 the occurrence sporadically and of single examples, 1 the use of adjectives fairly frequently and sometimes in conjunction. For possessives and datives 3 shows sole use of juxtaposition and 1 a near-normal English set of distinctions, while 2 is again an indication of uncertainty and inconsistent usage.

Table 6.23

Levels of attainment reached in selected micro-structural items

<u>Name</u>	<u>A/C</u>	<u>No. marking</u>	<u>Possess.</u>	<u>Dative</u>	<u>Adj.</u>
AA	1	3	1	2	1
SA	3	1	1	1	3
KB	3	1	(2)	3	3
MB	2	3	3	3	3
CC	2	2	1	1	1
JC	1	2	3	3	2
DG	3	1	3	(2)	3
JH	3	3	(3)	(3)	3
PI	3	3	(3)	(3)	3
AP	3	2	(3)	3	3
BP	3	2	2	1	3
DP	3	1	(3)	3	3
FR	2	1	1	2	2
MS	3	2	2	3	2
RS	3	3	1	3	1
SS	1	3	2	2	3
LT	3	1	(2)	2	3
MW	3	1	3	2	2
SW	3	1	2	1	3
TW	3	3	(3)	(3)	3

Figures in parentheses indicate an estimate in the cases where no relevant forms were produced.

Levels attained in each of these items were compared, using Spearman's rho ( $\rho$ ) correlation coefficient, corrected for ties. The values obtained and their standard errors (Connolly and Sluckin, 1962) are shown in Table 6.24.

Table 6.24

Correlation coefficients between selected micro-structural elements

(Figures in brackets = standard errors of the coefficients)

All values are positive.

	<u>A/C</u>	<u>No. marking</u>	<u>Possessive</u>	<u>Dative</u>	<u>Adj.usage</u>
A/C	-	.414 (.190)	.594 (.149)	.334 (.204)	.661 (.129)
No. marking		-	.021 (.229)	.487 (.175)	.021 (.229)
Possessives			-	.611 (.144)	.538 (.163)
Datives				-	.261 (.214)

A low correlation indicates no common relationship between the items being correlated, suggesting that, for example, development in one area was not matched in another. Correlations

may be either positive (indicating a relationship in the same direction) or negative (a relationship in the opposite direction). A high positive correlation would suggest that development was occurring in parallel in the items being compared.

Table 6.24 shows that this last condition is found in the group being studied: children advanced in A/C words tend also to be advanced in use of elements of nominal phrases and use of adjectives. Similarly, correct normative use of possessives is paralleled by correct use of datives and more fluent utilisation of adjectives. However, the figures by themselves do not show the strength of this relationship. This can be brought out by calculating t-ratios: the ratio of the coefficient to its standard error. A high t-value would show that the coefficient was unlikely to have occurred by chance and that any confidence placed on it (that it showed a real relationship) would be unlikely to be misplaced. T-values of different levels are conventionally taken as standards:-

<u>t-value</u>	<u>probability of chance occurrence</u>	<u>relationship</u>
1.96	$p < .05$	significant
2.85	$p < .01$	- highly significant
3.3	$p < .001$	- very highly significant

Table 6.25 allows us to examine the values of the relationships given in Table 6.24.

Table 6.25

t-values of correlation coefficients in Table 6.24

	<u>No. marking</u>	<u>Possessives</u>	<u>Datives</u>	<u>Adj. use.</u>
<u>A/C</u>	.05	.01	NS	.001
<u>No. marking</u>	-	NS	.01	NS
<u>Poss.</u>		-	.001	.001
<u>Datives</u>			-	NS

(NS = No significant relationship).

From Table 6.25 we can see that our generalisation, that there is some "across the board development in the children studied in microstructural elements is reasonably well founded. On the whole, the level of attainment reached in A/C words is weakly paralleled by attainment in accuracy of number marking and highly related to use of different possessive structures and use of adjectival modifiers. Number marking, in contrast, appears to develop more in isolation, while possessives are closely related, developmentally, to dative structures and adjective use.

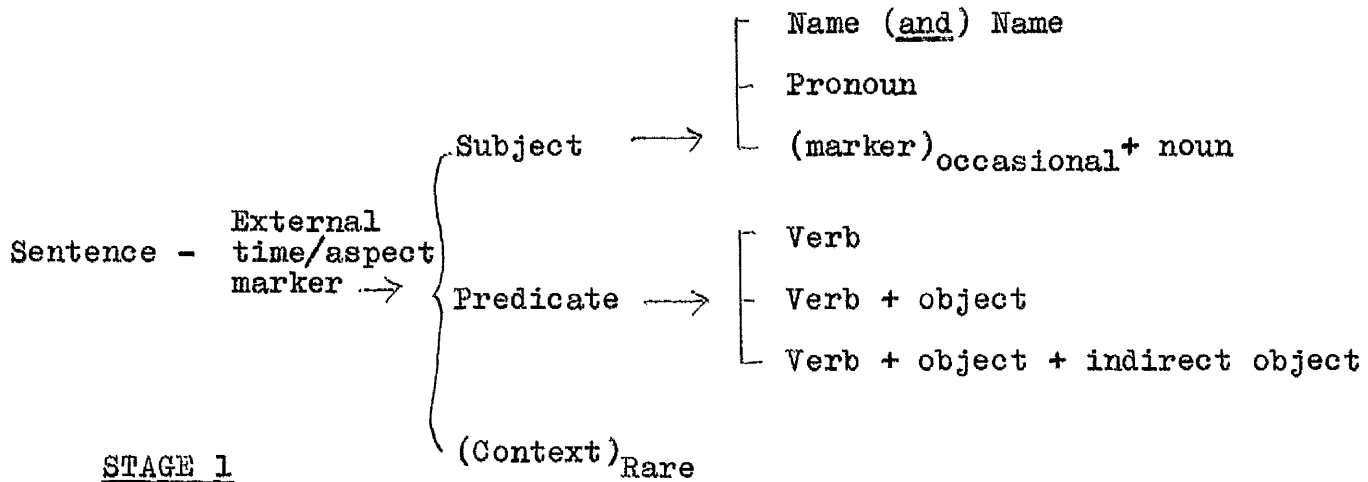
These conclusions should be treated with caution for a number of reasons:-

- (1) The original data on which the correlations are based are rather poorly quantified;
- (2) Many children reach only the lower level of attainment, Stage 3, in all items. This may inflate some of the coefficients of correlation;
- (3) Some levels were estimated (marked in Table 6.23 by bracketed digits) since some children did not produce these forms;
- (4) Some children show considerable departures from the schematisation. Thus the coefficient showing a weak relationship between development in A/C's and number marking, obscures the important fact that the most highly developed children in terms of the former tend not to mark their nouns for number at all.

However, there are no good theoretical grounds for hypothesising differential rates of development in these different elements. Common-sense suggests that one would expect roughly parallel rates of development and this seems to have occurred.

In general, then, we can see a rather slow development from a primitive to a more advanced ability to communicate.

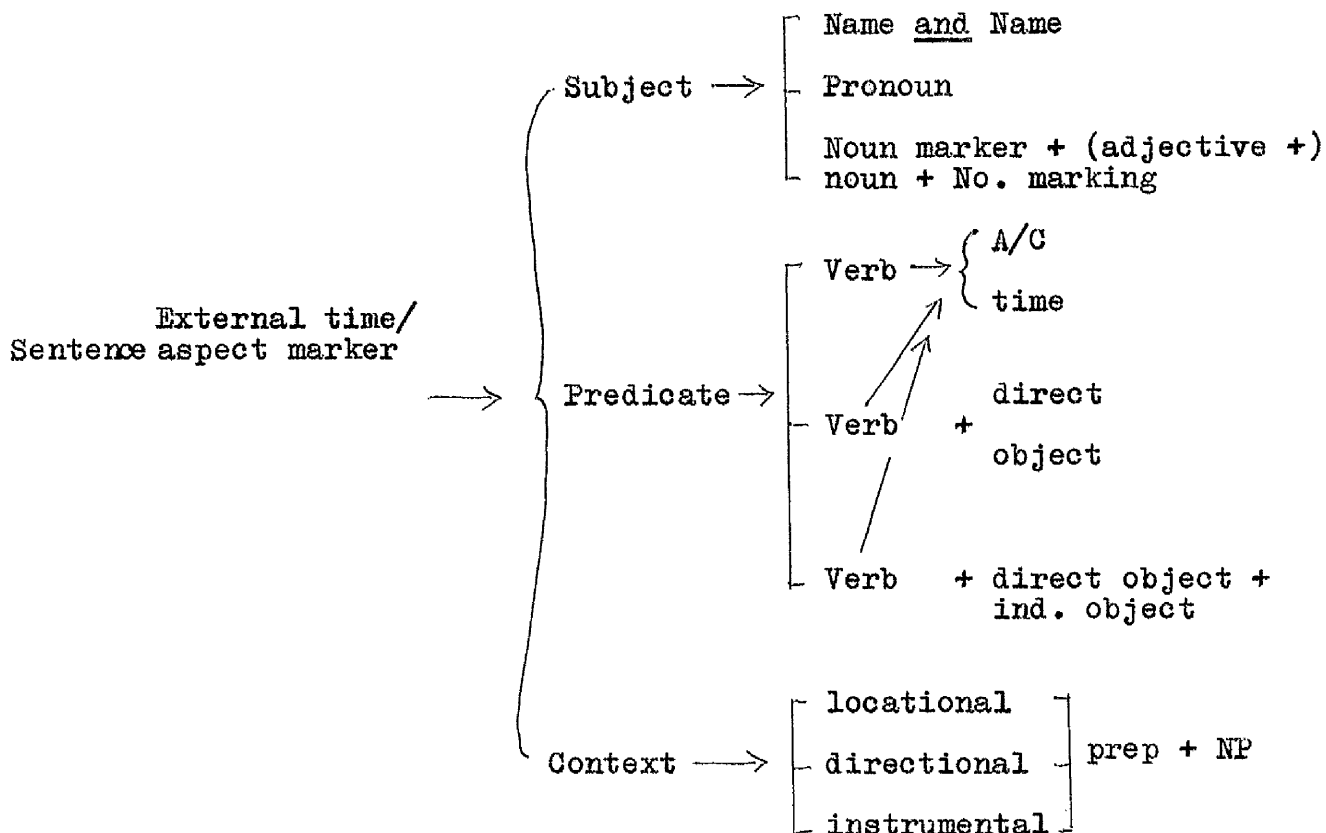
Among the children tested, both in this investigation and by Ivimey and Lachterman, the most primitive stage is marked by definite structural features: words do not occur at random but appear in sets of fixed and definable relationships, representable in a network format as:-



This structure is capable of communicating a wide range of information but is still relatively limited. Using an analogy from photography it is as though a photograph shows the major components of a scene but is somewhat out of focus: detail is missing. Thus there is no clear indication of time, aspect or number relationships, detailed specifications of nouns and verbs (action cores) by means of modifiers are very rare, and little of the background to the major activity is given.

As the children tested grow older and enjoy further conceptual and linguistic experience the communicative model

gains greater definition: number marking appears and some distinction is made between different time references in verbal phrases. Nominal phrases become better defined by the use of adjectives.



## STAGE 2

The time element in the predicate is in most cases initially a contrast between future time and a common, undifferentiated amalgam of present and past. Later this system differentiates further into future, past and present marking (Stage 3). Differences of aspect rarely appear. Attempts to mark aspect



distinctions appear to be by means of adverbs: everyday for repeated actions and finished for single events. However the evidence for this is not clear, since such uses may be artefacts of the eliciting method.

In the case of one child, MB, there may be seen a rather hesitant approach to aspect marking. In sentences with undifferentiated past reference (i.e. in response to yesterday or some other similar stimulus) she used mainly unit-verbs in present form:-

The two girl kick the boy (P )

Yesterday the boy and girls (= singular)  
watch the t.v. about funny

The dog pull the postman trousers (P )

When the stimulus everyday was added, she gave two examples with have been:-

Last year her father have been smack everyday

Last year the boy had been climb the tree everyday

In this case have been may indicate a frequentative aspect, contrasting with the simple aspect of the unit-verb. It would be dangerous to erect a whole aspectual system on these two examples, especially since similar forms were given to the "simple" stimulus.

Yesterday father have been smack her face

Yesterday the dog have been pull the postman trousers

In these cases, however, a frequentative interpretation would also be possible.

Apart from this example no attempts to distinguish between different aspects can be detected in the whole corpus of data. This is not surprising. Time marking is by no means certain for almost all the children and since aspect is probably rather more abstract a concept than time, its occurrence, rather than its absence, would call for explanation.

#### Mesostructural systems

The major structural patterns of affirmative sentences used by the children studied have been discussed above and the detail has been filled in through analysis of microstructures. It is now possible to return to a further examination of mesostructural alternatives. These may be considered under three headings: negation, questions, and passives.

#### Negation

For the majority of the children tested negation is shown rather simply. Where the affirmative sentence can be shown to be represented by

Subject + Action Core + .....

Negatives become

Subject + NEG + Action Core + .....

For these children (MS, PI, BP), the exponent of NEG is simply not:

PI

The two girl kick the boy → Today the two girl not kick the boy  
Soon the boy climed the tree → Soon the boy not climed the tree  
Yesterday father smack the boy → Yesterday father not smack the  
boy

Roughly half of KB's negatives also adopted this form.

A larger group of ten children, including KB, use apparently more complex forms of exponent for NEG:

did not (AP, CC, SA)

CC

The two girl did not kick the little boy (P)  
Tomorrow his father did not smack his face  
Yesterday the big boy did not climb up the tree

is/was not (LT, TW, JH, MW, KB)

TW

The girl kicked the boy → The girl was not kicked the boy (P)  
Tomorrow daddy smacked the girl → Tomorrow daddy was not smack  
the girl  
Before the boy climbed the tree → Before the boy was not climbed  
the tree

One child used could not:

MB

Today the two girls could not kick the boy legs

Tomorrow her father could not smack her face

Last week the boy could not climb the tree

and one, RS, used will not, in 10/14 sentences, of which only four had future reference:-

The silly boy will not climbed a old tree (P)

The naughty girl will not kick a boy leg (F)

The naughty girl will not kicked a boy's leg (Pt)

His other sentences include was not (Present and past reference), didn't not (present) and a simple pre-verbal not:-

Before the girl not gave a dog a bone

In this case, his first attempt, crossed out, was:-

Before the girl will be not gave a dog a bone

These various exponents for NEG seem to be pseudo-forms: the children are aware that they exist but do not realise this full meaning. They seem grander and in several cases appear technically "correct". Their application to different time referents indicates that they do not carry any normal implications of time, aspect, ability or whatever.

Thus although they appear more advanced they are still, in fact, conceptually very primitive.

This is not surprising when it is remembered that all of these children, except SA, HB, RS and KB, are in the more primitive group of unit-verb usage with their action-cores. The three exceptions have moved towards a dual system in time marking in A/C's but have apparently regressed to this rather more primitive level in the handling of negatives.

Two other children, JC and SW are also in the stage of dual A/C's, but they retain this twofold system in their negatives. Both use will not with future reference and one of the other forms for past and present time.

SW

Now the two girls did not kick the boy's leg

David not gave a sweet to Jane (P)

Daddy did not smack his face (P )

Tomorrow the boy will not climbed the tree

JC

The big boy is not punched the little boy (P)

Last week the two girls is not kicking the little boy

Tomorrow the big boy will not punched the little boy

Next week the dog will not pulling the postman

Of the remaining three children who have all developed a threefold distinction of time in affirmative sentences, all

show some regression to a rather earlier stage of development in their negatives. SS contrasts negative futures (will not) with some confusion between past and present:-

Tomorrow father will not smack the boy's face

Yesterday father did not smack boy's face

Man did not smack the boy's face (P)

Everyday father didn't smack the boy's face (P)

The boy is not climbing up the tree (P)

This may indicate some regression, which can also be seen in AA, who uses mainly a pre-verbal not with present and past reference:-

Today he not smacking the boy face

Before he not climbed the tree

He will be not play the ball (P)

Next week the two girl will not be kicking her

Tomorrow he will be not smack his face

The confusion between will he not and will not be may indicate transition from will be acting as a complex indication of simple futurity to a more advanced stage of true time and aspect auxiliary usage. AA uses will be + V(ing) for five out of six affirmative future sentences.

Similar features can be seen in FR's negatives. In the present and past we find isnot V(ing). Only one

sentence is different:-

Last week they did not kick the boy

Futures contain will not or is/are not going to:-

Tomorrow he will not smack his face

Next week they are not going to kick the boy

Soon he is not going to climbing up the tree

These forms contrast with the equivalent affirmative, and we may have some confidence that these are real auxiliaries being used productively.

We see in these examples several examples of regression from the developmental level reached in affirmative sentences to a slightly lower one when a negative component is introduced. Considerable research has shown that normally hearing human beings are limited in their capacity to transmit information. In Miller's experiment ( Miller, 1967 ) this has been encapsulated in the famous figure of  $7 \pm 2$  items capable of being held in memory at one time. Other examples are too well known to need discussion here. Among the children studied it seems that a similar throughput-constraint is operating. Converting a complex of concepts and percepts (input stimuli + linguistic models) may reach a fairly high level in affirmative sentences. Addition of a further complexity (adding the expression of negation) results

in a partial breakdown and regression to a simpler, probably more firmly based affirmative model.

### Interrogatives

Obtaining samples of interrogatives from the deaf children proved rather difficult. In part this was due to a fairly widespread confusion between the meaning of ask and tell and probably of question. On being asked "Ask a question", several children gave answers.

AA produced mainly causal statements:-

Tomorrow watch the T.V. because like to watching about Dr. Who.  
Because he climbing the tree. He like enjoy himself (P)

Elsewhere, where a genuine interrogative seemed to be achieved his punctuation was erratic:-

Why! big boy smack his face because he be rude to him.

No yes/no questions could be elicited at all. This may reflect use of a manual communicative system where a question is often asked by accompanying a clear affirmative statement with an interrogative gesture (e.g. raised eyebrows). But this may not be the only reason. It seems that the deaf do not often ask questions for mere confirmation of what is already known or surmised (requiring a yes/no answer), nor do teachers often ask such questions. More common, in the experience of the



children are questions seeking further information, involving an appropriate word: where, when, why (what for) and so on. It is these questions that the children asked in the sampling situations.

The commonest form of interrogative involves preposing a statement by a Q-marker, normally one of the words given above: where, when, why, etc. In the following examples the basic affirmative sentence is enclosed in square brackets labelled with a subscript ]<sub>s</sub>.

PI:

Why ]<sub>s</sub> [father smack the boy] ]<sub>s</sub>

What for ]<sub>s</sub> [the boy climbed the tree] ]<sub>s</sub>

Tomorrow what for ]<sub>s</sub> [Jane and Peter watched the television] ]<sub>s</sub>

Yesterday what ]<sub>s</sub> [Jane and Peter saw the television] ]<sub>s</sub>

Last week why ]<sub>s</sub> [the dog bit the postman] ]<sub>s</sub>

In all, 8 children used exclusively the primitive device, which may be indicated as:-

Interrogative = Q + S , where S = affirmative sentence.

In one case, the exponent of Q seems to be a pseudo-form, similar in origin and use to those found in negatives:-

CC:

Why did s the two girl are kick the little boy s (P)

Why did s tomorrow the dog bite his leg s

Why did s last week we watch the television s

In the case of the future the A/C appears to have been simplified, omitting will:-

Tomorrow the dog bite his leg

This may be a further example of regression to a simpler level already discussed in the case of negatives. Since this form of asking questions is used on some occasions by 19 out of the twenty subjects it is probable that all of those who reach higher stages of development in affirmatives have similarly regressed.

One child only departs from this pattern, placing Q between the subject and A/C:-

DP:

The man why smack his the face (P)

The girl and boy what watch the television (F)

The dog where bite the postman? (Pt)

Within this relatively primitive interrogative structure there are some distinctions between Q words. Words like when, where and why represent the interrogative equivalent

of affirmative contextual phrases that can be tacked on,  
more or less at will, to the basic S + A/C + (O) pattern.  
Thus we find a dual system in operation.

(i)	<u>affirmatives</u>	<u>interrogatives</u>
	S + A/C + (O) + (context)	Q + S + A/C + (O) + (context)

Who and what, in contrast appear to represent more fundamental  
elements of the basic structural pattern since they can replace  
one of its items, usually the subject phrase:-

FR:

Who has climbing up the tree? (P)

Yesterday who biting the boy's leg?

MS:

Who bite postman? (Pt)

(ii)	<u>affirmatives</u>	<u>interrogatives</u>
	S + A/C + (O) + (context)	Q + A/C + (O) + (context)

These can be contrasted with the type described above:-

PR:

Why did he smack his face (P)

Why did will biting the boy tomorrow

Why did they kick the boy (P)

Why did they watch the television yesterday

(Why did appears to be a pseudo-form, the exponent of Q here).

MS:

Why the two girls kick his leg (P)

Where Jane and David watch (Pr)

This duality can be seen in ten of the children tested. What is particularly interesting here is the fact that in nine cases out of ten, the deleted word from the sentence is the subject. Only one child deleted the object and asked a question about it:-

AP:

Who Mary and John watched in the television (F)

This may explain some of the bizarre findings referred to earlier, of Taylor, Quigley and Davis (opera cit.)

### Passive Sentences

It has been shown above (Chapter 2) that deaf children have difficulty in producing and understanding passive sentences. Since correct handling of these sentences involves the ability correctly to use the preposition by and the auxiliary be V + en and it has been shown that the deaf children studied are often poor in both these areas it is not surprising that they misuse and misinterpret the mesostructure as a whole. The past participial ending -ed has no regular and systematic reference for these children and where be occurs, its use often seems idiosyncratic, merely marking (at best) a crude distinction of time.

The problem of relying on spontaneously produced language data, that has already been discussed, is particularly relevant here. Were it not that the actual reference of the sentences is known and can be compared with other systematically collected sentences also with known reference, the following might be interpreted as "faulty" passives:-

Before Daddy smacked on the face (TW)

(for was smacked)

Last year her father have been smack everyday (MB)

(for had been smacked)

and

Next week the dog will be pulled the postman (JC)

( = will be pulled by the postman)

Systematic elicitation of data, however, enables us to realise that these apparent passives would owe more to the guesses of the observer than to the child who produced them.

Of all the sentences elicited from the children studied there occurs only one possible passive, while in the spontaneous language samples to be considered later there are only one or two questionable examples. The single possible passive sentence in the whole corpus of data is:-

The boy fell over by a large stone (RS)

If this is a true passive (or proto-passive?) sentence, then it provides evidence for an anomalous use of fell over, treated as a transitive causative taking an inanimate subject. It is probably safe to assume that few deaf children use or understand passive sentences. This should cause no surprise. Ivimey (1977c) has shown that there are great parallels between the developmental levels of the language of deaf 10-year-olds and the famous Adam and Eve of Bellugi, Brown and Fraser. If this comparison be well-founded then absence of passives should be expected: few 18-month - two-year-old babies use the form.

#### Attributive verbs

At this point, before going on to examine those examples of macro-structural or complex sentences that appeared in the elicited data it will be appropriate to discuss a group of words that although bearing some similarities differ in some respects from the Action Cores, be and have.

In an earlier unpublished paper Ivimey (in manuscript) argued that be and have can be seen as growing out of a common base: that in which the subject and complement/object are seen as marking an attribution-relationship of the antecedent N.P. It is for this reason that sentences containing them are tentatively labelled as attributives here.

Thus I am a man and I have a dog are seen initially as describing attributes of me. Only later will the dual

distinction between attribute and possession develop. The earlier stages of confusion between the two forms appear in some of the sentences of the ten-year-old children studied by Ivimey and Lachterman.

Only two of the older children still seem to be in this very primitive stage: AP uses have for be in nearly all cases:-

<u>be</u>	P	<u>I had happy</u>	<u>I am the boy</u>
		<u>He had happy</u>	<u>You are the good boy</u>

F Next year I will have the fall

Pt A long time ago I had baby (= was)

PI distinguishes between have and be (in the present), the latter being almost universally omitted:-

P	<u>I happy</u>	<u>I not sad</u>
	<u>You are boy</u>	
	<u>He are boy</u>	
	<u>We girl and boy</u>	
	<u>They three girl</u>	

F Soon I big boy

Pt A long time ago I baby

For her have appears in present affirmatives:-

I have the ball

You have the dog

She have the dog

but may be replaced by be:-

They are two icecream

In the negative the attributive is omitted (as it is with be)

I not the ball

In the future it is replaced by be:-

Next week I am the ball

Next year you was the dog

but have is used with past reference:-

Last week I have the ball

Among the remaining children the distinction between attribution and possession appears to be fairly constant, although there do occur some examples of confusion. What is perhaps more



interesting is that development of these attributives appears to parallel that of the performative A/C's. For nine children the attributives occur as typical unit verbs, with no systematic alteration to indicate differing time reference:-

JH:

<u>Be</u>	Present	Past	Future
	<u>I am boy</u>	<u>A long time ago I am baby</u>	<u>Soon I am very tall</u>
	<u>You are boy</u>	<u>Before you are boy</u>	<u>Soon you are boy</u>
	<u>We are children</u>		
	<u>They are girl</u>		
<u>Have</u>	<u>I have big ball</u>	<u>Last week I have big ball</u>	<u>Tomorrow you have big dog</u>
	<u>She have big dog</u>		
	<u>They have icecream</u>		

Of the nine children in this stage of unit-verb attributives, six also use unit verbs with their A/C's. Three (KB, SW, DP) have advanced in the use of A/C's to the stage of distinguishing between two different time referents.

Four other children (also using "dual A/C system") appear to be developing similar distinctions with their attributive verbs. CC and MW are developing a distinction between future and past/present, while SA is distinguishing between past and a common future/present reference. RS seems to be moving, with considerable uncertainty towards a three-

fold distinction with be:-

RS:

<u>Be</u>	Present	Future
	<u>I am silly boy</u>	<u>I will be life of school next year (= leaving?)</u>
	<u>He was very clever</u>	<u>You are silly boy in next year</u>
	<u>We are good children</u>	<u>Next year they will be a nice girl</u>
	<u>They are nice girl</u>	

Past

I am baby in a long time ago  
You have silly boy last week  
Last week we was good children  
Before they was nice girl

but maintains a dual system with have:-

<u>Have</u>	Present	Future
	<u>I have a colour ball</u>	<u>Tomorrow I will be have a colour ball</u>
	<u>You have a new dog</u>	<u>Tomorrow I will be have a new dog</u>
	<u>She have a new dog</u>	
	<u>They have a icecream</u>	<u>Tomorrow they will be have a icecream</u>

Past

Yesterday I have a colour ball  
Yesterday they have a icecream

In all these examples similar nominal structures appear as in the case of normal performative-verb sentences: uncertain or no marking of time, non-standard use of the and a and often normatively irregular prepositions. RS uses the same future marker with have as with the performative A/C's'.

Five children altogether appear to make a threefold distinction between present, future and past reference with their attributive A/C's, especially in the case of be:

AA:

<u>Be</u>	Present	Future
	<u>I am a boy</u>	<u>Soon I will be a 13-year old</u>
	<u>He is a bully boy</u>	<u>Soon you will be a boy</u>
	<u>We are children</u>	

Past

Long time ago you was baby  
Long time ago we was a baby  
Long time ago they were horrible girl

<u>Have</u>	Present	Future
	<u>I have a ball</u>	<u>Tomorrow I have a new ball</u>
	<u>She have a dog</u>	<u>Next year they will be have a icecream</u>
	<u>They have a icecream</u>	

Past

Yesterday I have a ball

Yesterday you has lost her dog

Yesterday they have a icecream

In his original manuscript, Ivimey showed that the development of attributives appeared to lag behind that of performatives and argued that this reflected a conceptual difficulty: many performatives are relatively easy to demonstrate and tend to be used fairly consistently - one person hitting a boy is very like another! In contrast, be and have cannot be so readily demonstrated and their use is more varied. On the one hand they resemble performatives, indicating attribution and possession, while on the other they are mere carriers of time, aspect and number information. As a result of this duality they are less "stable" than the performatives. On the analogy he had developed in a report on the development of English morphophonology (Ivimey, 1975) where he had shown that this lack of stability in adult usage resulted in delay in acquisition of the relevant rule, Ivimey argued that this similar instability in the use of attributives would also retard their development. In some rare cases children show an advance (e.g. MB and JC who use a dual system with performatives but are moving towards a threefold distinction in the case of statives), while in others, the children show a regression (KB, SW and DP) between statives and performatives.

Table 6.26 shows a comparison between developmental levels in performative and attributive A/C's.

Table 6.26

Comparison between levels of attainment in be, have and  
performative A/C's

- = : at approximately the same stage of development  
< : retardation relative to A/C's  
> : advance relative to A/C's

	% unit verbs	<u>Be</u>	<u>Have</u>	
JC	8	=	<	
AA	9	=	<	
SS	9	=	<	
FR	23	>	<	
CC	25	<	<	
MB	30	>	=	
SA	46	=	=	
KB	48	<	<	
RS	55	=	=	
DP	55	<	<	
LT	64	<	<	
MW	69	=	=	
SW	71	=	>	slight?
MS	82	=	=	
AP	82	=	>	
JH	83	=	>	
PI	88	=	>	
DG	91	=	=	
BP	95	=	=	
TW	100	=	=	

Summary:    be        =    A/C's in 13 cases  
                 >    "        in 2 cases  
                 <    "        in 5 cases  
  
              have      =    A/C's in 9 cases  
                 >    "        in 2 cases  
                 <    "        in 9 cases

We see that there is some evidence, although little more than a strong trend for Ivimey's finding to be confirmed in this older group: attributives are delayed relative to performative A/C's. There appears also to be a difference between be and have, but this is statistically insignificant.

#### Negatives

In general the attributives resemble normal English negatives, taking NOT or a form of it after the verb. It is not infrequent to find an individual child using the same exponent of NEG. in his stative as in performative A/C's. Thus AP uses did not in three out of four cases, usually omitting be or confusing it with have:-

we did not children  
F        :    you did not has happy  
Pt       :    we did not big

These forms can be compared with:-

They did not kick the boy (Pt)

The two girl did not kicking the boy (F)

CC uses a similar exponent in future and past.

For MB the could not exponent of NEG., found in her performative A/C's also appears in some of her attributive constructions:-

He could not a boy now (P)

Although the majority are "regular":-

I am not a baby (P)

He not be a baby (P)

We are not big girl (Pt)

You not soon baby

In LT's negatives there is a strange obtrusive to:

I was not to boy (P)

We are not to children (P)

(and similarly in future and past reference).

This to is also found with have:-

I have not to the ball

Tomorrow you have not to dog

It was shown above that two processes operate. (1) in the case of performative A/C's, addition of the NEG. element to the conceptual input into the hypothesized language producing system resulted in a regression to simpler A/C usage. (2) it was also shown that be and have appear to develop rather more slowly than the performatives. It is interesting to see these two processes combining in the attributives. Almost all children show some regression to more primitive levels of development. Table 6.27 allows us to see the extent of this regression.

Table 6.27

Comparison between levels of development in affirmative and negative attributive A/C's

<u>Name</u>	<u>Affirmative level</u>	<u>Negative level</u>	
		<u>be</u>	<u>have</u>
AP) PI)	Confusions between <u>be</u> and <u>have</u>	UV + Conf. Ø	UV Ø + be/have conf.
BP	UV ( <u>be</u> , <u>have</u> separate)	UV	UV
MS	"	"	"
TW	"	"	No example
KB	"	"	UV
SW	"	"	"
JH	"	"	UV + conf.
DG	"	"	"
DP	"	"	UV
LT	"	"	"
CC	Dual system	Confused dual system	
MW	"	UV	UV + conf.
SA	"	Dual	UV
AA	Threefold system	Ø mainly	Dual
JC	"	Dual	UV
SS	"	Threefold	UV
MB	"	Dual	UV
FR	"	Dual	Conf. UV



In this table "confusions" = a confusion between be and have. Only two children showed this in affirmative statives: with the negative five children do so. We can detect also a tendency to omit be in negative constructions. This is not surprising in the case of PI who reaches a very primitive level in all aspects of her language development. It is more surprising in the case of AA who reaches higher levels and is quite adventurous in his attempts to communicate. For MB, also quite advanced, be drops out in futures, contrasting with common past and present (in present form).

In total we can see eight examples of regression in the case of be + NEG. and ten with have + NEG.

These confusions and regressions give further force to the suggestion discussed above, that attributives develop rather more slowly than performatives.

### Interrogatives

It was very difficult to secure interrogatives, partly because these are difficult to illustrate and partly because the standard stimulus picture + instruction required the child to stand outside the depicted situation. These cannot be the sole reasons, however, since a negative requires much the same sort of skill and a fairly large range of negatives was obtained. Once again it seems that the elicitation approach was requiring of the children something they do not usually experience: it is more common for teachers to ask

them questions rather than the reverse. Add to this the conceptual difficulties underlying use of attributives that has already been discussed and a powerful explanation is to hand.

In fact, only 44 interrogatives were obtained from the twenty children. About one-fifth of these appeared normatively correct:-

Where is my Parker pen? (RS)

Who is the boy? (RS)

Who are you? (SA)

However, these do not reflect a true, widespread competence on the part of these children, for RS also wrote:-

Who is the children?

and SA:

Where is my live? (= home? = do I live?)

Other children moving towards this normatively correct pattern are, perhaps, MB (This is who?) and MW (Are you who?).

For the most part, however, the children tested use a pattern similar to that in their performative sentences:

Q + S .

PI: Why s [you are boy] s  
      What for s [I have the ball] s  
SW: Where s [I am] s  
      When s [you have dog] s  
JH: What for s [I have big ball] s

Similar structures are used by 13 children. Some apparently anomalous forms are:-

(1) AP: When s [I was the ball] s

probably indicating a confusion between be and have (which also appears in AP's negatives),

(2) DG: Where s [they are the girls] s  
      What s [you are the boy] s  
JH: Who s [you are boy] s  
      Who s [they are girl] s

These may reflect the simple juxtaposition of Q + S found elsewhere, or they may represent an appositional usage. Pronouns appear in many children to be rather weakly developed and it may be that use of the post-verbal noun is intended as a reinforcer, the sentences being representable by:-

Who they are, the girls?

Who you are, boy?

Post-verbal elements in attributive sentences

In attributive sentences one of the most immediately noticeable features is the confusion of grammatical class status between post-verbal adjectives and nouns. Only six of the children tested appear to distinguish between these categories:-

SA: Today the weather was nice

Next week it will be foggy

I am very happy

I am a boy

Next year I will be 13 years old which makes me  
a teenager

Of these six children, three (FR, MB and AA) also use a nominal marker before post-verbal noun-phrases in A/C sentences, while three others do not (DP, SA, AP).

Thirteen of the children (65%) make no (or uncertain) distinction between nouns and adjectives:-

MS: I am happy

It is sunny

It is rain

I am boy

He are boy

Of course, this omission of a nominal marker is acceptable when the noun-phrase is plural, but this correctness is probably fortuitous in the case of these eleven children.

In most cases the nominal-marker, where it occurs is a (as in the examples above) but AP uses the:-

You are the good boy

I am not the boy

In terms of normal English sentences like this appear truncated, demanding a continuing relative:-

I am not the boy who .....

and their occurrence may have been responsible for the Heider's assertion that sentences in Deafish appear to form isolated units. It is more appropriate to regard the Deafish nominal markers, a/the, as different in function from their English counterparts. In Deafish, a sentence like I am not the boy is not truncated but forms a perfectly normal, viable unit.

In the case of have, the majority of the children use a nominal marker with the post-verbal noun-phrase. Only three children (BP, SW, JH) make no use of a marker at all. All of these are in the most primitive stage of development of attributive verbs. Two further children (TW, DP) appear to

be in an emergent or transitional stage, with very uncertain usage:-

TW: Yesterday I have big ball  
She had the dog (P)  
They have an icecream (P)

Of the fifteen children (75%) who regularly use a nominal marker, three use the in all cases and ten use a. Two children use both. This kind of inflexible usage often results in rather strange-appearing sentences if English nouns are used. However, once again, the sentences seem to be perfectly correct in terms of Deafish standards.

#### Extended sentences

The eliciting instrument was designed to obtain simple sentences. These were not defined rigorously but were seen, rather impressionistically as containing a single structural pattern of subject + predicate + optional context phrases. In the event a small number of non-simple or extended sentences were provided spontaneously by the children tested. In all these formed about 3% of the total affirmative corpus of data, or a little over 40 sentences of different sorts. In each of these non-simple groups we find two separate simple sentences linked in some way. Such a unit is called here an extended sentence. One problem in defining such a sentence arises from shortcomings in punctuation.

Thus:-

Today the postman is came to the house the dog bite the postman (JH)

may be a true extended sentence or it may be that it should represent two successive simple sentences incorrectly linked through omission of appropriate punctuation. In some cases punctuation can be ignored:-

Because the big boy climbed. up the tree to fetch the ball. (JC)

But the problem then arises: if we ignore the mid-sentence full stop here, are there good grounds for accepting the final stop, separating the continuation:-

The big boy had to fetched them.

This looks like a new, separate sentence, but it may not be. Such a categorisation would reflect the application of English rules to Deafish with the real danger of making false judgments. The heuristic procedure adopted here is to accept the punctuation as it stands, unless there are good reasons for rejecting it. This can be seen in the earlier examples. JC uses climbed up elsewhere as a unit. The full stop appears at the end of a line of writing and seems to be irrelevant for meaning purposes: every line of writing ends with a stop in JC's protocol. In the great majority of cases the end of the line coincides with the end of a simple sentence. Hence we

may reject the full stop in this case.

The simplest form of complex sentence appears to be a conjoining device. This is achieved in three ways. One, probably the most primitive, appears to be confined largely to children at the lowest level of development: conjoining by juxtaposition:-

Tomorrow the man smack his face the boy sad DG

(DG uses be in simple sentences, including negatives. Its omission here may reflect the influence of the longer sentence, imposing greater cognitive strain on her language processing skills).

Several children conjoin sentences by means of a linking "and":

The big girl is kicking small girl's back and other big girl is kicking her leg AA

The postman went to open a gate and he didn't know about dog RS

Before the boy is over the river and he sat on the ground JC

With the exception of one such sentence by BP, this use of conjoining and is restricted to children at the higher levels of A/C development, those with greater language sophistication.



In general the co-referential noun phrase is retained in the second component of these sentences although often by a pronoun. In only a single case do we find omission of the second co-referential NP:-

The boy over the river and fell on the grass RS

A third form of conjunction is contrastive, using but:-

I have a ball but not car MB

Before the boy jumped the river but it alright SS

The man is going to post the letter but the dog is pulling the postman trousers SA

MB produced a second example of contrastive conjunction, but apparently using a pseudo-form:-

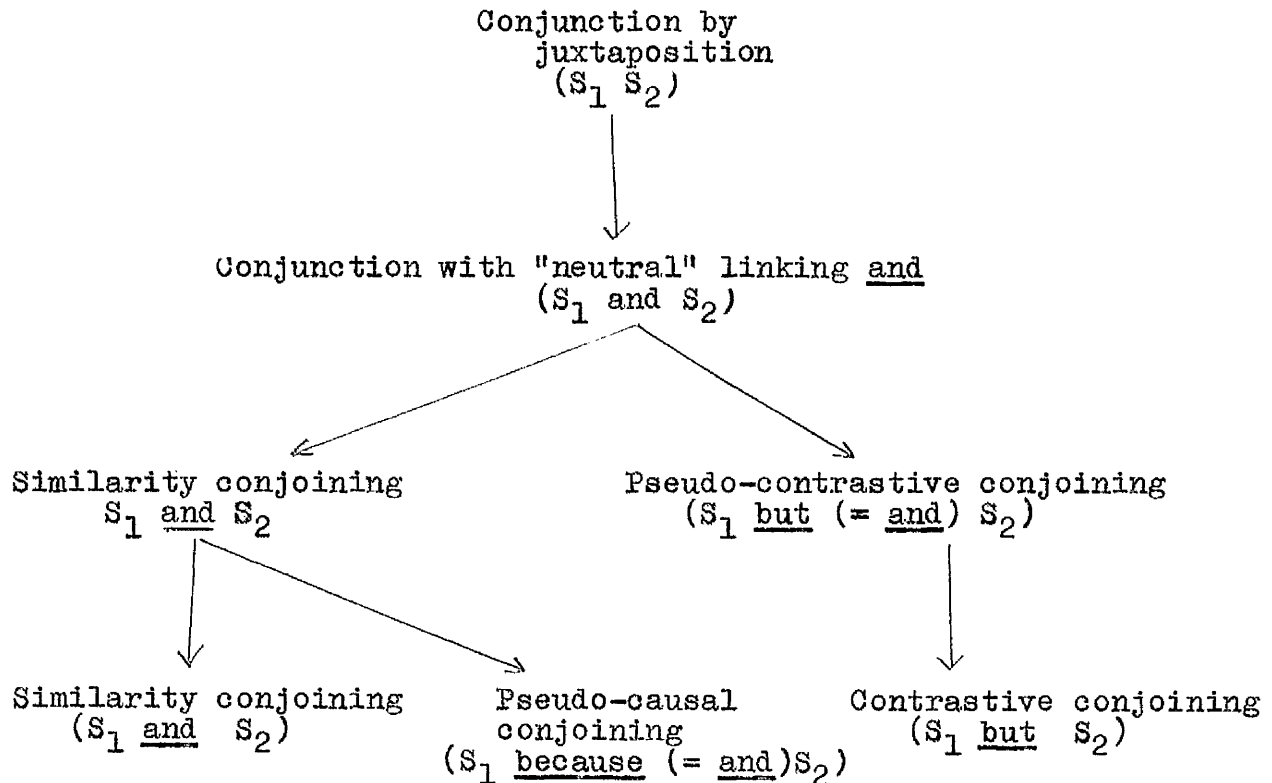
This week the boy will be climb the tree everyday but today the boy climb the tree.

It seems as though a word like and or as well would be more appropriate here. If this is a real example of pseudo-form usage then the other, apparently correct, example may also be a pseudo-form, only fortuitously correct.

AA may have used and similarly, with intention to achieve a contrast:-

Yesterday I have a ball and he not play

It may be that, in these examples, nineteen in all, we can detect a pattern of emergence of conjoining strategies: the most primitive form is by mere juxtaposition. Later this is replaced by and, which may indicate both similarity and contrast. Later the contrastive conjunction separates by way of a temporary pseudo-usage:-



In similarity conjoining the second co-referential NP may be replaced by a pronoun or omitted if it is subject of its sentence, but in most cases must be retained in full if it is object.

Causal sentences

Several children attempted to indicate a causal relationship between two successive sentences. The sentences may remain distinct:-

Why the boy rude her father? because the boy want to be toys (RS)

(Be in the second sentence probably reflects the be/have confusion discussed earlier).

Why did tomorrow the dog bite his leg. Because the dog was cross. (CC)

In other cases the two simple sentences fuse to form a single extended utterance:-

Tomorrow the (= they) watch T.V. because like to watching about Dr. Who (AA)

The boy was sad because Daddy was angry (P) (SW)

Man did not smack the boy's face because he is good (SS)

In other cases, the complex sentence may be a result of errors of punctuation:-

Why! big boy smack his face because he rude to him (AA)

(AA found it very difficult to form a question, in every case supplying an answer instead or as well. In reply to "Ask a question" he wrote:-

Because he climbing a tree

Because the big girl is horrible to her.

Other similar examples are:-

Why you give me some present because today is your birthday MW

These forms may be true causals but some at least appear to be pseudo-causals inasmuch as because does not imply causality. Normally:-

$S_1$  because  $S_2$  implies  $S_2$  causes  $S_1$

in pseudo-causals the order of sentences is reversed:-

$S_2$  because  $S_1$

Such a form may appear non-sensical (e.g. The boy had an accident because he is in hospital, rather than The boy is in hospital because he had an accident).

It is probable that here because is merely a grander-appearing version of and. SA provides three examples:-

Everyday the two girls alway kicked the boy's leg, because he cried.

The dog bite the postman's trousers, because his trouser is hole.

The boy said "what for". because who kicked me.

FR also used this pseudo-causal construction:-

The boy was not notice because he fell over the stones

It may be that these pseudo-causals form an important and necessary stage in the development of true causals.

Vygotsky (1934) has noted this in the case of young hearing children.

#### Temporal complexes

It may be that JC's attempt at using when is also an example of pseudo-usage:-

When the postman was posting the letter and the dog came its barked and run to pull the postman trousers.

This was the most complex of all the sentences produced by the group as a whole, consisting of two pairs of simple sentences in juxtaposition, each pair being linked by and:-

(S<sub>1</sub> and S<sub>2</sub>) (S<sub>3</sub> and S<sub>4</sub>)

The use of when, seems to be vague and almost meaningless, but it may be that, here, JC is attempting to convey an imperfective aspect, or it may be, as suggested above, merely a pseudo temporal word.

### Relative structures

Only four children produced what may be primitive relativised extended sentences:-

The boy was run that fell over MB

Next year I will be 13 years old which makes me a teenager SA

The other two examples are rather more primitive, apparently caused by deletion of the co-referential NP and without replacement by an appropriate relative form:-

The boy ran stone fell to shoe IT

Yesterday the two girls kicked the boy crying DG

The first of these may arise merely from conjoining by juxtaposition with deletion of the subject in the second component sentence, but DG's sentence appears to have real primitive relativisation status, similar to those produced by the younger deaf children in Ivimey and Lachterman's original study.

The mechanisms of relativisation and conjoining strategies in Deafish will be examined in detail in Chapter 8.

### The significance of pseudo-forms

At several places in this chapter attention has been drawn to the occurrence of what are called pseudo-forms: those cases where Deafish words resemble normal English words but

without the same significance. Examples are:-

(1) pseudo-morphology in A/C words: where children in the early developmental stages appear to be breaking away from the more primitive unit-verb by using pre-verbal auxiliaries but who do not suffix the A/C word endings in -ing or -ed, for example, with any consistent and distinctive reference.

(2) Some, used as a pseudo-mass noun marker, may have the same status. It is used rarely and then mainly to indicate singularity, rather than indeterminate plurality.

(3) NEG. has many exponents: is not, did not, could not, but these do not have similar implications to identical forms in English.

(4) Other examples are the use of but, non contrastively, of because without any hint of a causal relationship between the sentences it conjoins, and possibly also of when.

These apparent misuses are of great importance in any theoretical analysis of developing cognitive-linguistic models, and they have been discussed by Piaget (1926) and Vygotsky (1962).

Vygotsky refers to Piaget's work as follows:-

Piaget demonstrated that the schoolchild's concepts are marked primarily by his lack of conscious awareness of relationships ..... Piaget asked seven- to eight-year olds the meaning of the word because in the sentence "I won't go to school tomorrow because I am sick". Most of the children answered, "It means that he is sick"; others said, "It means that he won't go to school". A child is unable to realize that the question does not refer to the separate facts of sickness and of school absence but to their connection .... Thus he cannot supply a correct ending to the sentence "The man fell off his bicycle because ....." Often he will substitute a consequence ("because he broke his arm") (op. cit. p. 87).

In this case the children appeared to know that the word existed but did not realise the implications it carried: that sentence A was the result of, or caused by, sentence B. For them, because implies sentence A and sentence B. Elsewhere, Vygotsky describes this usage as a pseudo-concept, not "wrong" in an absolute stage but a necessary stage on the path to the acquisition of true concepts.

If this be true (and it is mirrored in the acquisition of other aspects of language, e.g. Lewis ( 1963 ) ) in the case of the development of meanings in early childhood and Ivimey (1975) with English morphology) then a similar form appearing widely in the language of thirteen-year old deaf children suggests that many of these children, although still at a rather primitive stage of development are applying similar conceptual strategies to the process of the construction of cognitive-linguistic rules as normally hearing children.

However, at this stage the order of occurrence of the two causally-related sentences is not essential for the recovery



of meaning since the relationship that is perceived is conjunctive rather than causal. Thus one might find either:-

The man fell off his bicycle because he broke his arm

or:

The man broke his arm because he fell off his bicycle

both equally meaningful to a user of Deafish. It is clear that, in normative terms, it is the first of this pair that is wrong and the second right. Yet the essence of this stage of pseudo-causality is that, for the child who is in it, both are equally correct. Now, if a child used one or only a few examples of "wrong" causals, an observer might underestimate his linguistic competence: words are occurring in profusion but not in the right order (Fusfeld, op. cit.). In contrast, if he used one or a few examples of the "correct" form, his competence could be quite seriously over-estimated. These considerations provide additional powerful evidence against the custom of relying for analysis of apparently deviant languages on spontaneously produced samples (in which only a few or a single example of any form might occur and then with uncertain reference) and then of applying to them criteria based on a different, normative system.

## CHAPTER VII

### The validity and reliability of the elicited language sample

In Chapter 4 it was argued that if linguistic statements are to be accepted as scientific theories, then the problem of assessing them must be located within the more general problem of assessing the veridicality and scope of any statement, and more specifically, of any scientific statement concerning human behaviour (p. 142 above). It was shown that, in practice, this problem reduces initially to one of measuring or estimating the validity and reliability of the sample of human behaviour that is obtained for analysis. Of these two concepts, validity is the more important, since a sampling technique may be invalid yet yield results with a high degree of reliability, i.e. intra-test consistency. Thereafter, the normal canons of scientific model-making must apply: the analysis must be founded on the empirically-derived data, it must be parsimonious in the assumptions it makes, it should cover as wide a sample of cases as possible and it must be testable or preferably, in Popper's view, falsifiable.

### Validity of the elicited sample of language

In Chapter 4, four different types of validity were described. Of these the elicitation method certainly reaches the level of face validity, since it secures samples of language and some teachers who have examined the elicited

language sample have recognised it as "typically deaf". But the method used in this investigation also satisfies the more stringent requirements of the higher levels of validation. It is relatively easy to show this in the case of criterion-related validation, i.e. a comparison between the language obtained in the elicitation method with that obtained by earlier workers. This comparison presents some difficulties since many of the earlier investigations are based on fairly mechanical enumerative methods of analysis that have been rejected here as superficial and misleading.

However, it is possible to examine the data obtained through elicitation in a similar way to that used by the earlier workers and thus to form some clear ideas as to the extent of its validity in terms already accepted by the research community.

A (1) Myklebust (op.cit.) has examined, among other things, the mean number of sentences per child in his sample and the mean number of words per sentence. His data are not directly comparable with those in the present study since his age-groups cover two-year spans. However, taking the figures of his older and younger children (11-13 years, 13-15 years) we may compare them with the 12-13 year old children studied here:-

Table 7.1

Comparison of words per sentence between Myklebust's sample (op.cit.) and the present sample

	Boys	Girls	Total
<u>Myklebust: 11-13 years</u>	5.3	5.7	5.5
<u>" 13-15 years</u>	6.4	7.7	7.1
<u>Ivimey 12 years</u>	5.97	6.25	6.14

Examination of Table 7.1 reveals that the children studied here fall between the figures given by Myklebust for children aged 12 years and 14 years. When the results are compared statistically no significant difference arises ( $\chi^2 = .053$  with 1 d.f.  $p < .90$ ). A  $\chi^2$  value of this magnitude indicates that the observed differences are almost certainly due to random effects.

Myklebust used larger groups of children than Ivimey but, in compensation secured only a very limited amount of written language from each child. In contrast a rather small number of children were studied in the present investigation but from each child there was elicited a much larger corpus of language.

Table 7.2

Comparison of total sentences produced by samples of Myklebust and Ivimey

	<u>Boys</u>		<u>Girls</u>		Total
	N.	Sentences	N.	Sentences	
<u>Myklebust: 11-13 years</u>	118	696	109	916	1612
<u>" 13-15 years</u>	80	736	85	901	1637
<u>Ivimey 12 years</u>	8	798	12	1136	1934

From Table 7.2 we see that, although the present study involved fewer children, the analysis was based on a substantially larger corpus of data.

From the sheer size of the corpus of language analysed both by Myklebust and in the present study it appears that, at least on this level of enumeration the elicited sample is valid.

A (2) When we leave this superficial level and examine the actual language produced we find similar evidence for equivalence of samples. Reasons for ignoring Myklebust's so-called "deafisms" have been given (pp. 39 ff., above). The major reasons advanced were that in relying on spontaneous data, Myklebust was obliged to guess at the reference of each of the apparently incorrect forms, and that he gave no firm criteria for assigning different forms to any specific class. In contrast it is possible in the present study to achieve this. In the sample elicited here can be found many examples of Myklebust's "deafisms":-

(i) Omissions (Myklebust: A boy playing)

Yesterday they were watch the television programme (MW)

The two girl kicking the boy next week (AP)

The boy running jump over the river (CC)

- (ii) Substitution (Myklebust: A boy will playing)  
Next week the two girl will kicking the little boy (JC)  
They will watched the television (SA)  
Next week two girl will kicking him (SS)
- (iii) Additions (Myklebust: A boy is be playing)  
The boy is climed the tree everyday (Pt) (LT)  
Now the boy is walks over the river (JC)  
The boy can jumping over the river (AA)
- (iv) Word order (Myklebust: A boy playing is)  
Next week the two girl be will kick the boy (PI)  
Today mother giveing to him present (AA)

These examples, taken at random from the protocols of the children tested, and including children at all levels of development studied, show that the eliciting method of sampling language appears to obtain a valid set of sentences.

B A similar comparison with the published reports of other investigators forces us to much the same conclusion. If we take one report in a very different tradition: that of an attempt to analyse the language of deaf children as a system we can immediately detect powerful similarities.

B(1) Taylor (op.cit.) quotes many examples of typical "deaf" sentences and, once again, it is easy to discover identical forms in the present elicited sample:-

- (i) Verbless sentences (Taylor: The ant happy  
The bird away)

It has already been suggested that the first of these structures arises from the delay in Deafish in the development of be-usage. Many examples of this have already been given in Chapter 6 (pp. 246 ff above). The second structure may reflect the non-normal word usage of the deaf children studied in this investigation, for whom over, among others, seems to be an A/C word. In Taylor's sample away may also be an A/C word.

- (ii) Omission of prepositions (Taylor: The ant  
fell a water, The ant sleep a bed)

The boy ran the river (DP)

Kevin slept the bed (DG)

It should be noted (although she seems to have overlooked the point) that Taylor's examples indicate abnormal usage of determiners, with a being largely confined to post-verbal positions.

- (iii) Double verb structures (Taylor: Ant walk  
found animals, Ant run get pin)

The boy running jump over the river (CC)

The boy is ran jumpid over the river (JH)

- (iv) Incorrect complementisation (Taylor: He cannot know how to swimming)

The boy can jumping over the river (AA)

B(2) Various examples quoted by Quigley, Montanelli and Wilbur (op.cit.) can also be paralleled in the elicited language sample. For example, Quigley noted the emplacement of NEG. immediately before the verb in 50% of his 10-year olds:-

e.g. Dogs not can build nests

Among the children whose language samples were elicited this appears to be almost the only method of indicating negation by ten-year old children (Ivimey and Lachterman, op.cit.) 65% of older children use different forms: not, did not, is/ was not, could not, will not, but evidence was given above (pp. 264 ff) that these represent pseudo-negative forms, rather than the NEG-PLACEMENT and DO-SUPPORT T.G. rules postulated by Quigley and his collaborators. It is possible that Taylor's example:

He cannot know how to swimming

reflects a similar pseudo-negative form. This will be discussed more fully later.

B(3) Quigley's examples of interrogatives can also be explained simply in the way used in Chapter 6: a question is formed by preposing to the sentence a Q-marker, which may have several different forms as exponent. Thus Quigley's

Who did the dog chase the boy



need not be explained in terms of incorrect do support and other T.G. elements as Quigley does but as:-

Who did <sub>s</sub> [the dog chase the boy]<sub>s</sub>

This example reveals very clearly the weakness of a reliance on spontaneous language: if did indicates past-time then chase is correct, but if chase was actually intended to refer to present time then did is wrong. Quigley gives no evidence, beyond his own assumptions, that past time was intended. Who did occurs in the elicited sample as an exponent of Q.

In spite of this weakness, the appearance of an identical structure in two very different investigations suggests that both are tapping a similar source and that both have obtained a valid sample of language: what is in question is the subsequent analysis.

B(3) Other findings reported by Quigley and his co-workers can also be seen in the elicited corpus:-

- (i) error in use of auxiliaries (Quigley:  
The boy was hit the girl)  
Yesterday both was watched the television (SS)  
The silly boy was climed a old tree (RS)

- (ii) be/have confusion (Quigley: John is a ball;  
John has sick)

Numerous examples of these have been given above.

B(4) Other examples of parallelism between the present study and those of earlier investigators, are easy to find.

Brannon (op.cit.) reports that the language of deaf children is "telegraphic" and marked by an absence of function words\*, while Goda's work showed an excessive use of Fries' Class I and II words (nouns and verbs) by the deaf. The samples quoted in Chapter 6 support this: adjectives are rare, as are adverbs, while many auxiliaries, conjunctions and other grammatical categories are subordinate or apparently missing.

Simmons described the sentences of deaf children as simple, rigid and stereotyped. All of these labels could be applied without conceptual difficulty to the elicited samples of language and all give added support to any attempt at assessing the validity of the elicitation technique. As a result of these comparisons we can assert with some confidence that the elicitation method of sampling language reaches the level of criterion validation, at least in general terms, i.e. that numerous parallels can be readily found in the elicited corpus and that reported by other workers.

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\* It would probably be more accurate to see a non-standard but regularly systematic use of function words than a total absence.

However, this general agreement is inadequate. A more rigorous requirement is to demonstrate that the language sample obtained during the artificial elicitation sessions forms a sub-set of the language used spontaneously by the same children, and it is to this point that attention must be turned.

A comparison between elicited and spontaneously produced language samples

It will be recalled that, in addition to the elicitation method, each of the children tested produced a number of other more spontaneous written samples of language. These included:-

- (i) one or more "diaries", typically an account of the preceding weekend spent at home;
- (ii) one or more written accounts of a series of brightly coloured pictures;
- (iii) a reproduction of a story told previously by the class teacher, and
- (iv) a "free" composition.

The last was not attempted by all children as it seems to have been too difficult. In addition one piece of writing was repeated with specific reference to future time in the expectation that this would throw some light on the status of the "unit verbs".

At whatever level we consider it can be shown that the elicitation method obtains a valid sample of language; the elicited sample is a sub-set of the total actual potential language of the children tested. Tables 7.3 and 7.4 enable us to examine this assertion at the lowest level of enumeration.

Table 7.3

A comparison of mean words per sentence between elicited and spontaneous language samples

	<u>Sample</u>	
	<u>elicited</u>	<u>spontaneous</u>
boys	6.97	6.25
girls	6.25	7.23
total	12.22	13.48

We see that the mean length of utterance of the elicited sample is slightly smaller than that of the spontaneous sample. However this difference is not statistically significant ( $\chi^2 = 0.367$  with 1 d.f.,  $p < .90$ ) and arises from the tendency of two or three children to use many extended sentences in their spontaneous writing.

Table 7.4

A comparison of mean total number of sentences per child between elicited and spontaneous language samples

<u>Sample</u>	
<u>elicited</u>	<u>spontaneous</u>
96.7	105.8

This difference again is not statistically significant ( $\chi^2 = 0.409$  with 1 d.f.,  $p < .50$ ).

A series of more rigorous comparisons reinforces this conclusion. Table 6.3 (p. 200 above) shows that the children tested relied on a rather limited number of sentence patterns to communicate their meanings: SVO, SVL, SVD, SVO.dat/SVdatO, SV, SVLL and SVDL. Table 6.4 shows the proportions of the total corpus that these various sentence patterns occupy. Altogether they comprise almost 100% of the corpus. A similar analysis, using identical criteria, was carried out on the spontaneous corpus, (Table 7.5).

Table 7.5

Use of sentence patterns in the spontaneous samples of the children tested.

Child	SVO	SVL	SVD	SVOdat	SVdatO	SV	SVLL	SVDL	SVOL	SVOD
AA	✓	✓	✓	✓		✓				
KB	✓	✓	✓		✓	✓			✓	✓
AP	✓	✓	✓			✓	✓		✓	✓
MB	✓	✓	✓			✓		✓		
FR	✓	✓	✓			✓			✓	✓
MS	✓	✓	✓	✓		✓			✓	✓
JH	✓	✓	✓	✓		✓				✓
TW	✓	✓	✓		✓	✓				✓
JC	✓	✓	✓			✓				✓
RS	✓	✓	✓			✓				✓
CC	✓	✓	✓			✓			✓	✓
DG	✓	✓	✓			✓			✓	✓
SS	✓	✓	✓			✓	✓		✓	✓
SW	✓	✓	✓	✓		✓			✓	✓
PI	✓	✓	✓			✓			✓	✓
DP	✓	✓	✓			✓				✓
LT	✓	✓	✓			✓				✓
MW	✓	✓	✓			✓			✓	✓
BF	✓	✓	✓			✓		✓	✓	✓
SA	✓	✓	✓			✓			✓	✓

There is one major discrepancy between Tables 7.5 and 6.3: in the former almost all children make use of the additional pattern of SVO + context. In the elicited sample locational and directional information (i.e. the context) was confined to SV sentences. It is certainly a weakness that the elicitation instrument did not call for these SVO + context forms. However, in the analysis given on p.282 the form SVO + context appears as a possible, hypothesized form. Although actual examples were missing their existence was predicted and this prediction is confirmed, which does something to counter the omissions.

A numerical comparison also allows us to see broad similarities between the elicited and spontaneous samples. (Table 7.6).

Table 7.6

Comparison between proportions of sentence patterns occurring in the elicited and spontaneous samples

<u>Structural Pattern</u>	<u>% in elicited sample</u>	<u>% in sp. sample</u>
SVO	44.0	47.0
SVL	18.9	6.0
SVOdat	12.4	v. small
SVD	11.6	24.0
SVdatO	8.5	v. small
SV	4.6	8.0

Although these are quite large discrepancies ( $\chi^2 = 9.097$  with 3 d.f.) which are just statistically significant, they are probably not important linguistically since we are comparing language samples collected in diverse settings which would

surely make rather different stylistic demands on the children tested. What is striking is the predominance of the SVO pattern in both samples of language - in each case a simple SVO sentence occupies roughly 45% of the corpus.

Were we to attempt to write a network grammar, as on p.282 above, on the basis of the spontaneously produced sample of language it would at least in its major outlines be identical to that based on the elicited corpus.

These comparisons provide strong evidence for the validity of the eliciting method of sampling language and give us confidence that the language obtained for analysis was not seriously distorted.

These comparisons have been made at a rather gross level, focussing on group data. It is possible to show that similarities can also be found at the individual level<sup>x</sup>, whether we are examining affirmative sentences (where Myklebust's "deafisms" abound) or interrogatives:-

	<u>elicited example</u>	<u>spontaneous example</u>
BP	<u>what I do</u>	<u>why you late</u> <u>what you have for Christmas</u>
SW	<u>why he laughed</u>	<u>when you will move the</u> <u>house for sale</u>

---

x It is possible to demonstrate this rigorously but in order to save time and space only selected examples will be given below.

Even when we examine the single child whose interrogatives were unusual in terms of the group, in that the exponent of Q. was displaced from sentence initial position, we can detect a rough parallelism:-

	<u>elicited example</u>	<u>spontaneous example</u>
DP	<u>The two girls what for kicked the boy</u>	<u>The dog was died how</u>

Yes/No sentences

In the analysis of the elicited sample it was noted that very few Yes/No interrogatives could be found. It was suggested that, among the deaf, such questions may appear as statements accompanied by an interrogative gesture. A rather small number of such questions appeared in the spontaneous sample: they look like statements but context reveals their true interrogative status. Examples:-

BP	<u>I said, "You are finished the hospital"</u>	
	<u>He said, "Yes, I finished at 2 weeks or 3 weeks"</u>	
TW	<u>Please I have trolley</u>	(= may I have the trolley)
PI	<u>You back school</u>	(= ? Are you ready to go back to school)

Negative sentences

Similar parallels can be found in negative sentences:-

	<u>elicited examples</u>	<u>spontaneous examples</u>
MS	<u>He not smack his face</u>	<u>Bridie not liked firework</u>
PI	<u>Today the two girl not kick the boy</u>	<u>You not kick the ball</u>



In fact, out of the whole sample of spontaneous language only ten negatives occurred. Seven of these were identical in form to the examples given above. The remaining three approximate more closely to normal English forms:-

<u>Clare did not like the ghost</u>	LT
<u>David did not go to school</u>	PI
<u>Tommy mummy could not fight</u> (= find) <u>Tommy</u>	MW

These may be "correct". It is more likely, however, that they represent pseudo-forms. PI uses also:-

You not kick the ball

which parallels her elicited sample negatives. CC uses did not in her elicited language but as a composite exponent for NEG.:

Next year you did not baby boy (= will not be),

a clear pseudo-form. MW does not use could not in the elicited sample, but other children do, again as a pseudo-form.

#### Unit verbs

As part of the validation process teachers were asked to obtain spontaneous data from their pupils in parallel: either a piece of "News" or a story was to be obtained in a neutral fashion - in which one would expect many verbs to appear

in past form and with past reference. Thereafter the children were asked to write an imaginary diary or story in the future. Such an exercise was entirely novel to the children and the teachers were asked to give as much explanation as they felt necessary to ensure that their pupils fully understood the task. It was hoped that there would be sufficient overlap between these parallel passages for the existence of unit verbs to be demonstrable.

This aim was only partly achieved. In the case of three children no identical verbs were used in the two passages and no comparison could be made. Two other children were absent when the "future" passage was written. Of the remaining fifteen children, most used only 1 or 2 identical verbs in both passages. Six children used more, giving a mean total of 4.3 identical verbs per child.

These parallel uses were scored for change or maintenance of unit-verb. The former could be found in 77% of cases, the latter in only 23%. These figures provide only weak support for the existence of unit-verbs in spontaneous language, but this finding is not serious for a number of reasons:-

(i) several children, who used unit verbs in the elicited data merely wrote will or will be in front of all the verbs in the "future" passage. This appeared to be mechanical and may have arisen from the explanations given by the teacher before the exercise was carried out. In many cases the

changes made were inappropriate: in normal English not every verb in a passage with general future reference is likely to occur in the future.

(ii) Of the changes not all were in fact to a recognisable future form: 41% of the changes result in present form, 7% are mixed (will have look, will have help) and only 52% have recognisable future form. Many of these last would be technically wrong in English- futurity was scored where will appeared in the action-core phrase, whether it was linked with the "correct" stem or not. Thus will look and will come were scored as "futures" as were will looked and wàll came.

(iii) The majority of unchanged forms - examples of unit verbs occur as unit verbs with identical appearance in the elicited data.

Although this part of the investigation gives some support to the validity of unit verbs as seen in elicited data the evidence is rather weak. When some examples of extended texts are analysed in Chapter 8 other spontaneous uses of unit-verbs will be demonstrated.

#### Personal pronoun and adjective confusions

The elicited data provided a number of examples of confusion (in normative terms) between personal pronoun and adjective confusion. Similar examples occurred in the spontaneous samples.

Peter were toy in her bedroom

MB

(were = be/have confusion)

Policeman told you off

MW

(where the context indicates the use of me.)

They we are carried the box

KB

This last example may represent a slip of the pen, but KB produces a similar form elsewhere:-

Everybody we went in the coach

This curiously recalls the Russian contrast between *мы с вами* (we, you and I), *мы с ними* (we, they and I), etc. It may be that at this primitive stage of development KB feels that the simple, short pronoun is not explicit enough to convey her intended meaning.

We find also some examples of confusion between personal adjectives:-

Nanny Plaisted said, "her mummy The dog was dead DP

The context here indicates my mummy or just mummy as the expected form.

I think my cat was dead (think = UV)

Mummy said, "no my cat is not dead"

DG

They went look around his empty room

RS

Such confusions abound in the language of very young English-speaking children and it may be that their use here merely reflects the immaturity of Deafish. However, the confusions are made by the most as well as the least advanced of the children studied and it may be that forms are not, in reality "confused", so much as in free variance with each other. It is also possible that personal pronouns and adjectives perform rather different functions in Deafish than English. This point will be discussed in Chapter 8.

Other similarities between the elicited and spontaneous samples can be readily seen: apparent misuse of determiners, infrequent use of adjectival and adverbial modifiers, pseudo-causals and so on. These will be discussed and examples given in Chapter 8. Such similarities provide strong evidence for the validity of the controlled elicitation method of language sampling. However, as we have already seen in the case of mesolevel sentence patterns, in the spontaneous samples the children go a little further than the confines that the eliciting method allowed. We find the same tendency here. Thus we may be able to detect the emergence of passive forms in a very limited number of cases:-

So his mother put some sandwiches and a flask  
of coffee. They puts in the basket

JC

The dog called William

TW

Sometime chestnut was eat for peoples

MS

But there are only these three clear (and two doubtful) examples in the whole sample.

Then too some attempt is made in the spontaneous data at indicating modality or aspect and time succession:-

Perhaps I went to the swimming pool today DG  
(with use of unit verb, giving apparently wrong tense)

Later time, it is long way to Berkshire CC  
(recounted after a lengthy incident in her diary)

Such examples are missing in the elicited data but once again they are very rare in the spontaneous data.

Only one attempt at comparison is made:-

The bike is fast then (= than) dogs MW

Thus we see at both the mesostructural and micro-structural levels in spite of some limitation on forms elicited that there is strong evidence for the validity of the elicitation method of language sampling; i.e. that the elicited language sample is a sub-set of the total language productivity of the children tested, in so far as this can be estimated from a large corpus of spontaneously produced language. We will see in Chapter 8 that similar parallels can be found between the elicited and spontaneous samples at

the macrostructural level.

Moreover, although the range of mesostructural sentence patterns is somewhat restricted, the elicitation method does appear to tap all the major structural regions of the basic, hypothesized language space.

#### Reliability of the elicitation sampling method

Although it is possible to find a test instrument that is reliable, in that it gives a consistent measure from one situation to another, it may not be valid. An example would be a foot-rule that was, in fact 13" long. Measurements using it would be highly reliable but invalid. In contrast, a valid instrument will almost inevitably possess a high degree of reliability. In so far as what is being measured is stable then a test that is valid at one time will also be valid on a subsequent occasion and this validity will be reflected in consistent patterns of behaviour on both occasions. Since the data used in this thesis are valid, it would be reasonable to expect the eliciting instrument to be reliable: if the children tested use structured sets of rule to produce language, then a test that is valid on one occasion will be valid also on a second. If the language rules are stable then the test will be reliable.

However, as part of the present survey an attempt independent of assessments of validity was made to estimate

directly the reliability of the eliciting instrument. Six of the children originally tested were selected at random and were re-tested six months after the initial elicitation. The length of the period between test and re-test is quite critical: if it is too short then memories of what was done on the first occasion may contaminate responses on the second. On the other hand, if the intervening period is too long then new structures may be learned. In the first instance any attempted correlation will be spuriously high: memory will result in a high degree of similarity in responses. In the second the correlation will be spuriously low: the test and re-test will not be examining the same set of skills. This is especially likely to happen in the case of a set of developing skills. There are some signs that this has, in fact occurred: at least one of the teachers of the children tested seems to have felt that the original elicitation revealed some grammatical short-comings that needed to be remedied and taught what seemed to be appropriate (Personal communication). In fact, this teaching seems to have had rather little effect!

In normal psychometric work a high degree of similarity between test and re-test is sought, represented by correlation coefficients approaching positive unity (  $\rho = +1.0$  ). In the question of actual language behaviour it is doubtful whether this is either possible or desirable. Identity of performance is undesirable in that it would suggest either that the actual sentences written had been rote-learned, i.e. that the language was more psittacic than human, or that the



constraints of the elicitation method were so great that they dominated, and probably distorted, the possibly rather weakly established language skills of the children being tested. Some variability between test and re-test would provide strong evidence against such arguments.

Now, in the case of adult language users, at least (and probably to a lesser degree with juveniles) language appears to be very flexible: test-retest identity is hardly possible, thus one may use:-

We shan't be going to Paris this year

We are not going to Paris this year

We won't go to Paris in July

We're giving Paris a miss this summer

We usually try to be in Paris for July 14th  
but I have too much to do in London

Paris is out this year

and many other forms to indicate the same essential fact. Each of these sentences conveys rather different ancillary information with different emphases, clearly understandable to an adult English speaker, although a formalisation of the differences between the first two sentences, at least, may present some difficulties. However, if one were to elicit the first example on one occasion and the last on a second, one could not reasonably assert that the mode of elicitation was unreliable. More likely one would have to return to the

earlier statement that, in the final analysis, no complete assessment of an individual's language repertoire and skills is possible until that individual has stopped producing language, i.e. at death. More reasonably, if one could detect on the two occasions rather similar basic patterns underlying the language samples elicited (even if, as in the examples above, no very great similarity of response to individual items were discernible) then one would be satisfied that the speaker or writer was using essentially the same language as two different periods. Clearly, although one must apply the same canons in attempting to assess the veridicability of the sampling method, the actual mode of application must be flexible.

In fact, very little thought is required, to predict that in many, perhaps the majority of cases, very similar mesostructural patterns would appear on the two occasions: what would differ would be the lexical and some microstructural items. This is, in fact, what happened in the present investigation. Many changes can be detected at the lexical level:-

JH	(Test)	<u>Daddy smack him face</u>	(Pt)
		<u>Yesterday Daddy's smack him face</u>	
	(Re-test)	<u>Father smack his boy</u>	(Pt)
		<u>Yesterday father is smack his boy</u>	

In these examples the mesostructural patterns are clearly similar: it is the microstructural lexical and phrasal elements that change. Him face and his boy may indicate inter-test variability (i.e. low reliability) or they may indicate some additional complexity in Deafish. Since we find under-use (in normative terms) of prepositions and a frequent absence of determiners (especially the) in non subject-phrase environments, the first example may well be translated as:-

Daddy smack him (on the) face

This interpretation does not represent unsubstantiated speculation indulged in to save the model (Popper, op.cit.). It is based on the established structure of Deafish, and it enables us to reject with some moderate confidence the hypothesis that this child is confusing personal pronouns and adjectives. Him face and his boy do not indicate confusion in Deafish, only in English!

If we accept these microstructural differences as perfectly normal and desirable features of any language system used creatively we may focus on mesostructural similarities. Here we discover a high degree of test-re-test reliability:-

JC	(Test)	<u>Today the big boy is not punched the little boy</u>
	(Retest)	<u>The big boy is not smacked the little boy</u> (Pt)

- CC (Test) Last week the two girl did not kick the little boy
- (Retest) Last week the two girls did not kick the little boy's leg

Similar patterns can be detected in the case of interrogatives:-

- KB (Test) Why the girls kick the boy  
Why the man smack the boy
- (Retest) Why the two girls kicked the boy on his legs  
Why Daddy smacke the boy on his face

Before attempting to compute figures to show the actual degree of inter-test reliability, one further problem remains. This concerns, rather intriguingly, the nature of Deafish as a group dialect or language. In Chapter 6 it was shown that the semantic element NEG. and INTERROG had some variety in their exponents within the group, although individual children tended to be rather consistent in their own use. In the retest elicitation some children used forms apparently different from those they had used on the earlier occasion.

- AA (Test) Tomorrow he will be not smack the boy
- (Retest) Tomorrow the man is not smack the boy

This retest form occurs once in AA's original sample with a different verb:-

The two girl is not kick her today

and it seems in his case to be a rather subordinate exponent of NEG. However, it is used (either as is not or was not) by five of the other children tested (p.285 above) and appears fairly frequently in spontaneous written (and probably spoken) language. This evidence suggests that there is in existence a common Deafish marked by quite considerable variability in some of its elements and that individual children may utilise fewer or more of these roughly equivalent elements according to personal choice or the demands of any situation. Little more can be done at this stage except to hint at this possibility but it may be that earlier workers who have reported the inflexibility of Deafish have overlooked the possibility that, although Deafish interpreted as English may appear to be error-full and rigid, within its own limits there can be found considerable variability and flexibility. To the experienced Deafish-user this flexibility may have stylistic, emotional or social implications closed to the English-speaking interpreter. That this may be a very real possibility is supported by the average English colonialist's belief that, for example, Hindustani or Malay are rather primitive languages in which the many fine distinctions that can be made in English are totally absent. More detailed knowledge of Urdu and Malay, and especially of their literatures reveals that this ethnocentric prejudice is unwarranted. It is suggested that this may be the case also with Deafish.

In addition to this wider theoretical point, the

existence of this intra group variability, will cause - on a superficial examination - any assessment of intertest reliability to appear rather low. In the figures given in Table 7.7, this has been taken into account. A form used in the individual's retest but that does not occur in his original test has been accepted as similar if it occurs elsewhere in the group data.

Table 7.7

Proportions of similarity of structures in test and retest protocols

Child	Unit Verb	NEG.	INT.	Be	Have	Av.
AA	82	40	100	75	63	72
KB	70	100	100	80	80	86
CC	55	92	100	69	78	79
JG	71	100	100	93	100	93
JH	100	100	100	85	71	91
AP	82	100	67	75	60	77
Average	77	88	95	80	75	83

In Table 7.7 we see that an average index of agreement between original and second elicitations is 83%. Such a figure indicates a correlation coefficient in the region of +0.91, rather lower than would be acceptable in a strict psychometric test, yet one that nevertheless indicates a high degree of reliability, especially when we take into account the inherent variability of language behaviour.

Within this overall similarity there are one or two apparent rather serious discrepancies. Thus CC shows a great difference in her unit verb usage between the two eliciting occasions and AP shows a similar gap in his ability to handle have. In each case, inspection of the protocols shows that on the second occasion these children appear to have regressed to a rather more primitive stage: AP shows greater confusion between be and have on the second occasion and also tends to use have (sic) more. In the first test he used had in several cases (often with clear unit-verb implications). It may be that for him have and had are unit verbs in free variation. In the case of CC, in the original eliciting sample, she appears to be developing a fairly clear form of marking for futurity, but on the second occasion she has regressed to the more primitive unit verb usage:-

CC (Test) His father will smack his face (F)  
Next week the two girl will be kick the  
little boy  
(Retest) Tomorrow his father smack the boy's face  
Next week the two girls kick the little boy's leg

These regressions are difficult to explain but two possibilities are:-

(i) that the conditions of the test influence the performance of the children: the original testing was carried out slowly and individually. The retesting was rather more

hurried and carried out as a group;

(ii) that any emergent language structure is likely to fluctuate in its appearance. In the analysis of the original data (performed before the retest data were examined) it was suggested (p.224 above) that CC's use of future time marking was emergent and this may well be a plausible explanation. One would predict that SA, RS and SW would also show a similar regression under similar conditions, but this cannot be tested as they were not selected for retesting.

We see, therefore, that broadly similar mesostructural features are detectable in both the original and retested samples of language. Microstructural elements of a lexical kind are more variable, and some children provide varying amounts of contextual information in the two tests:-

KB (Test) Yesterday the man was smack the boy

(Retest) Yesterday Daddy was smacke the boy on his face

In addition, it is possible to show that usage of smaller microstructural non-lexical elements (the/a, apostrophe s, use of adjectives, etc.) is also broadly similar from one occasion to another. Examples of this can be seen in the parallel quotations above.



### Sensitivity of the eliciting instrument

We have shown above that the eliciting instrument appears to be both valid and reliable. It is also sensitive and enables us to detect rather fine differences of development between individual children. Little need be said here, since this has been abundantly demonstrated in the examples given in the preceding chapters. Here it will suffice to provide parallel samples of elicited sentences taken from children at three different levels of syntactic development. The first child was studied by Ivimey and Lachterman (op.cit.) and her syntax is analysed in Ivimey (1976(a)). The second child was one of those studied in the present investigation. The third was a hearing child, aged ten years, studied as part of the control group by Lachterman (op.cit.).

### Table 7.8

#### Equivalent sentences produced by three children

1: (deaf, aged 10)

#### Present continuous

The man punch the boy  
The two children looked the television  
The man is not punch the boy  
I have did not a ball

#### Future

Tomorrow the boy climbed up a tree  
Tomorrow the two girls is kicked the boy  
Tomorrow the man is not punch the boy

#### Past

Yesterday Mary and John looked the T.V.  
Yesterday the dog bite the postman  
Yesterday the boy did not climbed a tree

2: (deaf, aged 13) - CC

Present continuous

His father smack his son's face  
Peter and Jane are watch the television  
His father is not smack his face  
I have not on my car

Future

The big boy will climb up the tree  
Next week the two girl will be kick the little boy  
Tomorrow his father did not smack his face

Past

Last week we watch the television  
Last week the dog was bite his leg  
Yesterday the big boy did not climb up the tree

3: (hearing, aged 10)

Present continuous

A bully is hitting a little boy  
A boy and girl are watching T.V.  
He's not hitting him  
I don't have a ball

Future

Tomorrow John will climb a tree  
Tomorrow two little girls will kick a little boy  
Tomorrow a bully will not hit a little boy

Past

(Not tested) cf. Yesterday John climbed a tree  
Yesterday a bully was hitting a little boy  
Yesterday John did not climb a tree

In the case of child 1. we see use of unite verbs, pseudo-negative did not and no use of adjectives. (This was one of the more advanced of Ivimey and Lachterman's original sample). Child 2. is trying to use more varied nominal phrases and exponents of NEG. We can see the emergence of time marking in the future, but present and past reference sentences still contain unit-verbs. In contrast, the hearing child (3.) clearly distinguishes between his tenses (and also aspect, although examples are omitted here), makes full use of different negating structures and, through use of pronouns, attempts to achieve some stylistic coherence within the fragmented or saccadic eliciting format:-

A bully is hitting a little boy

He's not hitting him

As was shown in Chapter 6 only the most advanced of the older deaf children were attempting to do this.

The psychological reality of the analysis of elicited language samples

We have argued above that no theoretical analysis of any language sample can provide direct evidence of the psychological reality of that analysis, since both the theory and the items selected for analysis depend on identical pre-suppositions, and any similarities detected between them will be tantalogical. Any proof of psychological reality must be obtained in rather a different more independent way.

Such proof was sought against the background of cognitive psychology models (Anderson and Bower, 1974; Bruner, 1974; Flavell, 1963; Smith, 1970). Perception, in this model, is seen as involving the perceiver in making a comparison between incoming data and the cognitive model which he brings to the act of perception. Where incoming data and model closely match each other "veridical" perception occurs. Any mismatch will lead towards mistakes in perception while serious discrepancy may lead to a failure to perceive. In another context, Smith has described this as "not so much a matter of knowing how to look as knowing what to look for" (Smith, op.cit., p.1).

Bruner makes the same point rather differently:-

Perception involves an act of categorization  
..... we stimulate an organism with some appropriate input and he responds by referring the input to some class of things or events (op.cit., p.7) ..... What we mean is that the model of English with which the individual is working corresponds to the actual events that occur in English, and that if the stimulus input does not conform to the model, the resulting perception will be less veridical. (ibid., p.11).

At this point the theoretical analysis made in Chapter 6 applies only to the data analysed: it seems to account rather well for the sorts of sentences written by the children, and it has been shown that these sentences form a valid subset of the total number and types of sentence produced by the children during their twelfth year of life within their school

environment. No claim may be made for any wider applicability. Indeed it may be asserted that any reality of the rules described renders more in the psychology of the author than in that of the children studied.

However, following up the suggestion, quoted above, of Bruner, we may make a tentative step in the direction of establishing the reality (if any) of the rules in the psychology of the children studied.

A fundamental tenet in cognitive psychology is that perception and cognition are closely interlinked, probably even merely two aspects of an identical process. An important part of the analysis in Chapter 6 concerns the frequency of occurrence of unit-verbs. Table 6.8 reveals that 12 of the children studied used unit-verbs in over 50% of their sentences (and 8 in over 71%); 5 used them in between 20 and 50% of cases, while only 3 have developed a more sophisticated system of time marking, using unit verbs in fewer than 10% of their sentences. Of the five children in the intermediate stage four have developed a dual system, distinguishing between some form of future-marking in the one hand and a common unit-verb form for signalling present and past time. The fifth child has also developed a dual system, contrasting past-time marking with a common future-present form.

Now, it may be argued that, if this analysis has some psychological reality, then the suggested model will influence the perception of the children:-

I shall propose that the actual marks on a printed page (Smith is discussing the act of reading - G.P.L.) are relatively less important than the knowledge of language that a ..... reader has before he even opens the book. And the description of the visual process will imply that the information that passes from the brain to the eye is more important in reading than the information which passes from the eye to the brain.(Smith, op.cit., p.9).

We thus have an experimentally testable hypothesis: if the proposed analysis is psychologically real, then the linguistic model that arises from analysis will be very close in form to the linguistic model located hypothetically within the child's head, and the children will bring to any act of language perception a psycho-linguistic model with similar characteristics to those described here. The perceptual behaviour of the children may be explicated in terms of their individual psycholinguistic knowledge. More specifically, we may hypothesize (i) that those children whose model is characterised by major use of unit verbs will confuse or ignore distinctive time-marking features in simple written English;

(ii) that those children who use some form of distinctive marking only for verbs with future time-reference will correctly perceive future time-marking but will confuse or ignore present and future markers;

(iii) that those children who distinguish between present, future and past in their productive language will also distinguish between these forms in language inputs.

The children were allocated to each experimental category on the basis of the theoretical analysis carried out in Chapter 6. If the hypotheses are substantiated, then this will provide strong evidence for the reality of the proposed rules in the psychology of the children studied.

The nature of the experimental task that was to be carried out involved the reading of a series of simple sentences and their categorisation on the basis of time reference. This was indicated by the selection of one of the following "time" words for each sentence:-

yesterday	tomorrow	today
last week	next week	now
last year	next year	
before	soon	everyday

Each child was presented with a duplicated booklet in which the following sentences were presented in random order:-

Present (or near Future)

Mary is going to have an icecream  
It is raining  
They are coming to my house  
We are good children  
The dog bites the postman  
I go to school  
They have a train  
The boys help mother

Future

He will put the box on the table  
The boy will be helping his mother  
It will be foggy  
The boy will climb the tree  
The man will be reading a book

Past

John was talking  
We were having tea  
It was sunny  
Mary and Susan were playing  
I saw a dog  
Daddy came home  
Mummy gave 20p to Mary  
The boy jumped over the river  
I had an icecream  
The girls have kicked the boy  
We have given a bone to the dog  
John has come home  
I have had an icecream  
I have been to London  
I have closed the door  
Mummy has shut the window

This test was administered by the teachers of the children, and they were asked to give as much prior explanation as seemed necessary to ensure that the children fully understood the task. Teachers were told that examples could be given so long as they did not include actual sentences used in the test. The results of this test were quite striking (Table 7.9).



Table 7.9

Responses to time-marker perception test (raw scores)

- (a) Group iii (using more than 50% of unit verbs in productive language)

Categorisation

	<u>Present</u>	<u>Future</u>	<u>Past</u>
<u>English</u>			
<u>Present</u>	<u>13</u>	14	9
<u>Future</u>	45	<u>44</u>	64
<u>Past</u>	13	23	<u>9</u>

("correct" categorisations underlined)

- (b) Group ii (using 20 - 50% unit verbs in productive language, contrasting future with common present/past)

Categorisation

	<u>Present</u>	<u>Future</u>	<u>Past</u>
<u>English</u>			
<u>Present</u>	<u>7</u>	4	5
<u>Future</u>	3	<u>16</u>	1
<u>Past</u>	26	13	<u>29</u>

- (c) Group i (threefold time-marking distinction in productive language)

Categorisation

	<u>Present</u>	<u>Future</u>	<u>Past</u>
<u>English</u>			
<u>Present</u>	<u>6</u>	4	2
<u>Future</u>	0	<u>15</u>	0
<u>Past</u>	16	3	<u>32</u>

These sub-tables were tested with the  $\chi^2$  statistic under the null hypothesis that the observed frequencies were purely due to the operation of random effects, giving the following values:-

Group iii:	$\chi^2 = 4.047$	Not significant
Group ii :	$\chi^2 = 12.693$	$.05 < p < .02$
Group i :	$\chi^2 = 56.064$	$p < .001$

For Group iii, the low value of  $\chi^2$  does not allow us to reject the null hypothesis: children who are unit-verb users appear not to recognise the various markers of different time-reference of English. In the case of both Groups i and ii we can reject the null hypothesis, with greater confidence in the case of Group i than Group ii. Inspection of sub-table b in Table 7.9 shows that in 80% of cases the children who use a more or less marked future form with future time reference in their productive language also recognise it when they are presented with it. However, their use of a common present/past form or vestigial unit-verb for other time reference is mirrored by an inability to distinguish between such forms as helps-helped, come-came, and give-gave - have given. A computed  $\chi^2$  value for the present and past categorisation of this group is so low as to be negligible, indicating that categorisations here were purely random. The most advanced group appears to be well on the way to sorting out the differences between past and present time marking, although still with

some uncertainty. In the case of the present this probably reflects formal and semantic confusions between present and near past.

The findings of this experiment fully support the predictions made on the basis of non-linguistic theoretical models and we may assert with some confidence that, at least in so far as they refer to time-reference and time-marking, the analysis of the language skills of the children tested has some parallel, if not identity, in the psychological reality of the children. The test was also given to a group of 30 normally hearing children aged 7 years. The deaf and hearing groups were matched in terms of Reading Age: both had Reading Ages of 7 years. The categorisations of the hearing control-group are given in Table 7.10.

Table 7.10

Responses to time-marker perception test (raw scores) of the hearing control group

		<u>Categorisation</u>		
		<u>Present</u>	<u>Future</u>	<u>Past</u>
<u>English</u>	<u>Present</u>	119	54	20
	<u>Future</u>	44	88	2
	<u>Past</u>	187	14	257

These scores were also tested statistically, giving an even more extreme value than that of the most advanced deaf group

( $\chi^2 = 163.259$  with 4 d.f.,  $p < .001$ ). It seems that the hearing children are even more certain in their categorisations of English tenses but the differences in correct categorisations of the deaf (Group i) and hearing just fail to reach statistical significance ( $\chi^2 = 5.918$  with 2 d.f.,  $.10 < p < .05$ ). In spite of this there are some interesting differences between the deaf and hearing groups. The deaf appear to be more absolute in their categorisations. This can be seen especially clearly in the case of future tense categorisations. For the deaf, these are all definitely future, marked tomorrow or next week. In contrast for the hearing a large proportion of future tenses are categorised as applying to today. It is probably the operation of a sense of proximal futurity that causes this.

In the case of past-with-present-reference verbs (Twaddell, 1963), i.e. those like Daddy has come home, the hearing children divide equally in their categorisations: 91 are allocated to present, 92 to past. This categorisation seems reasonable in view of the ambiguities of English time marking. However, for the most advanced deaf children this form of the perfect is seen as implying pastness (67% of allocations) rather than the present (24%). Once again it seems as though, for the deaf past is past, whereas for the hearing children it may impinge very closely on the present.

These findings suggest that for the deaf, time (where it is overtly distinguished) is relatively crudely

structured in absolute terms. This parallels the similarly crude spatial structures revealed by their prepositional usage.

### Conclusions

An apparent danger of the process of eliciting language is that the elicitation instrument will constrain the responses of the children to such an extent that one is obtaining a very abnormal, artefactually structured set of utterances. Any subsequent analysis would, in such a case, be very weak. However, although the eliciting instrument used here has some weaknesses and limitations, the evidence discussed in this chapter suggests that artefactual contamination is not, in fact, very serious. The sample of language elicited appears to resemble very closely that produced spontaneously by the same children and that reported by other workers in this field. Replication of the elicitation produces sufficiently consistent result from one occasion to another to suggest that it is actually sampling similar language structures, while allowing enough variety to show that the instrument is not dominant. The instrument appears to be sensitive, allowing us to detect relatively small changes in language skill between individual children. Finally, at least some aspects of the analytical model appear to have some psychological reality.

## CHAPTER VIII

### Discussion and Conclusions

Fundamental assumptions to the research discussed in this thesis are that, before any meaningful analysis can be carried out in the language of a sub-group of subjects with group characteristics as clearly defined - and apparently abnormal - as the profoundly deaf are:-

- (1) the sample of language under consideration must have unambiguously known reference;
- (2) the analysis must be concerned with the systemic interrelationships occurring between the elements comprising that language;
- (3) that, as far as possible, the analysis should be carried out in terms pertinent to the language, and should avoid structural and other concepts derived from other language systems.

A fourth requirement that seems to be overlooked in most reported research is that since only a limited amount of language can be sampled it must not be merely assumed that the sample is valid. Instead this must be demonstrated. Careful search of the literature shows that the present attempt

at validation is unique in the field.

The elicitation method used to sample the language of the profoundly deaf adolescents studied meets all these requirements; the sample of language obtained is valid, reliable and sensitively defined. It has clearly and unambiguously established reference; at no point is an investigator forced to guess at what any subject is trying to communicate.

The analysis of the sample calls into play a rather different set of skills. The requirement of conceptual neutrality is probably too rigorous, especially in an enterprise as novel as this. However, the suggested Deafish categories of nominal, nominal marker, performative action-core and attributive sentence appear to be well-founded. Subsequent work may enable confidence in them to become more firmly established or they may have to be modified; the only test will be their utility in giving deeper insights into the structure of Deafish.

The analysis of meso- and micro-structural elements of Deafish allow us to approach the problems of interpreting longer texts more realistically than in the past. It will be recalled that a number of impressionistic descriptions of Deafish have been given by earlier workers. We have been told that Deafish sentences are relatively rigid and stereo-

typed, that they are often "telegraphic" in that they are characterised not only by omissions of auxiliaries, modifiers, and by wrong use of the English parts of speech, but also that the thought structure of extended texts is dislocated:-

The whole picture indicates a simpler style, involving relatively unrelated language units which follow each other with little overlapping of structure and meaning.

(Heider and Heider, op.cit., p.99).

The analysis in Chapter 6 has generally substantiated these points but with one very different orientation: most earlier workers have, by using terms like "errors" and "mistakes", betrayed their ethnocentric assumptions. This is a rather curious approach to language study. Many of the writers who use these terms conclude that the deaf are very delayed in their development of the various language skills, approximating in these to the levels reached by much younger hearing children. Yet with these one does not normally speak in terms of error, even though their language is, in adult terms, errorful. A more positive and fruitful approach is to regard the characteristics of each developmental level as a system in its own right that has grown out of earlier systems and that will form the basis for subsequent advances.

The distinction drawn here is not merely academic; the juvenile levels of language attainment reached by young hearing children are seen as perfectly normal. In contrast,



the language of deaf adolescents, seen as characterised by errors of syntax and an impoverished lexicon has led many observers to conclude that the deaf "have no language" (Furth, Fusfeld, *op. cit.*) and possibly that profound deafness may, in some way, actually prevent the deaf from being able to acquire language. Thus Blanton writes:

The organizational aspects of English, whatever their basic medium, may be almost impossible to learn without being able to hear.

(Blanton et al., *op. cit.*  
p. 82).

Furth has told us that a child born profoundly deaf is a human being without language and his work has been commended (with some reservation) as recently as 1977 in a reputable scientific journal for its contribution to the problem of the relationship between language and cognition (Gordon, 1977). Yet, if the conclusions of many workers are correct (i.e. that the deaf do acquire and use language rules that are rather similar to those of very juvenile hearing children) only two reactions are possible: either normal 3-4 year old hearing children are human beings without language, or Furth, Fusfeld, Blanton et al. are mistaken!

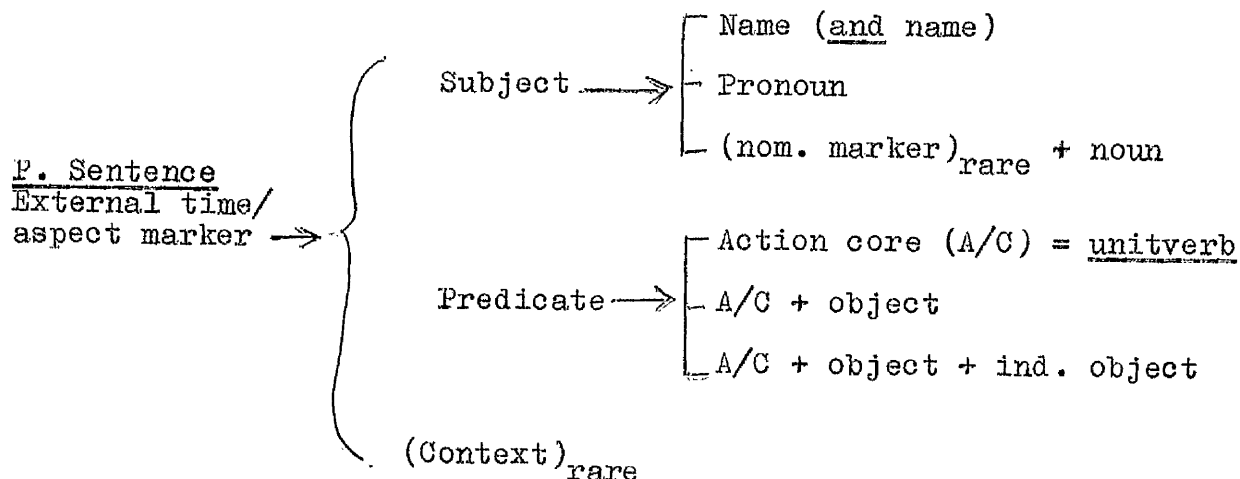
The solution to this problem is trivial: the deaf, including those studied here and those investigated elsewhere, do acquire an ordered set of rules that they utilise actively

to structure sets of arbitrary symbols in the production and interpretation of communicative acts. These rules seem also to be productive, in the sense that, they can be used to generate and disambiguate entirely novel utterances, even if only at a relatively crude level. The actual utterances produced by a deaf child on any specific occasion may appear to be very muddled, not to say chaotic, but underlying this chaos there seems to be a definite system. The mismatch between system and achievement merits more serious attention than it has hitherto received and will be examined later in this chapter.

Among the children studied by means of the controlled elicitation sampling method we can see two main stages of development. The lower stage is exemplified by the majority of the younger children studied by Ivimey and Lachterman (op. cit.) and some of the older children studied here.

### Stage 1

#### (a) Performative sentences



(Note: Object phrases have similar structures to subject phrases. Names occur frequently but nominal markers are very rare and where they do occur are a. Pronouns may be represented either by English object pronouns or by personal adjectives. However, there is in these much confusion as to person. Modifiers to nouns are very rare).

Negation: Where affirmative = S + Predicate + .....

Negative = S + NEG. + Predicate

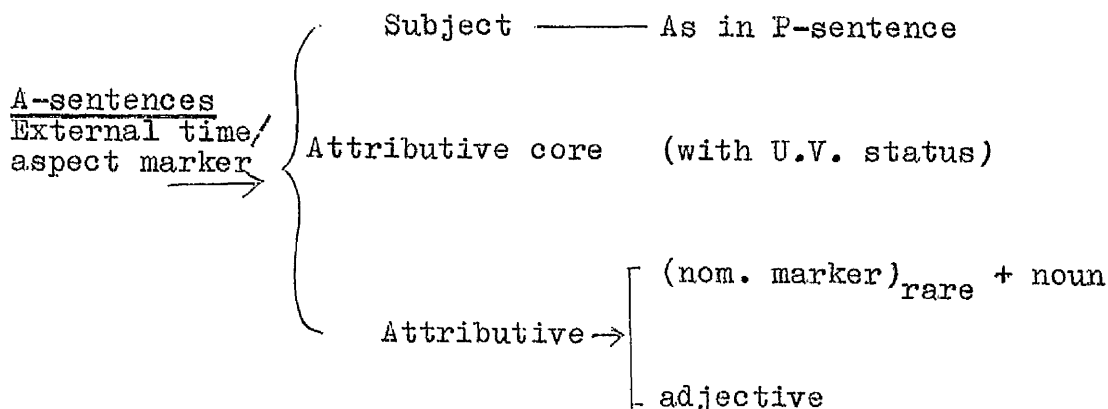
NEG.: = not, is not, did not

Interrogative: Where affirmative = S + Predicate + ....

INT. = Q + S + Predicate + ....

Q = where, when, why did, etc.

(b) Attributive sentences



(Note: the attributive core tends to have unit verb status and may appear as a form of be, have or ø).

Interrogatives: as in P-sentences

Negatives: where affirmative is S + Att. core + .....

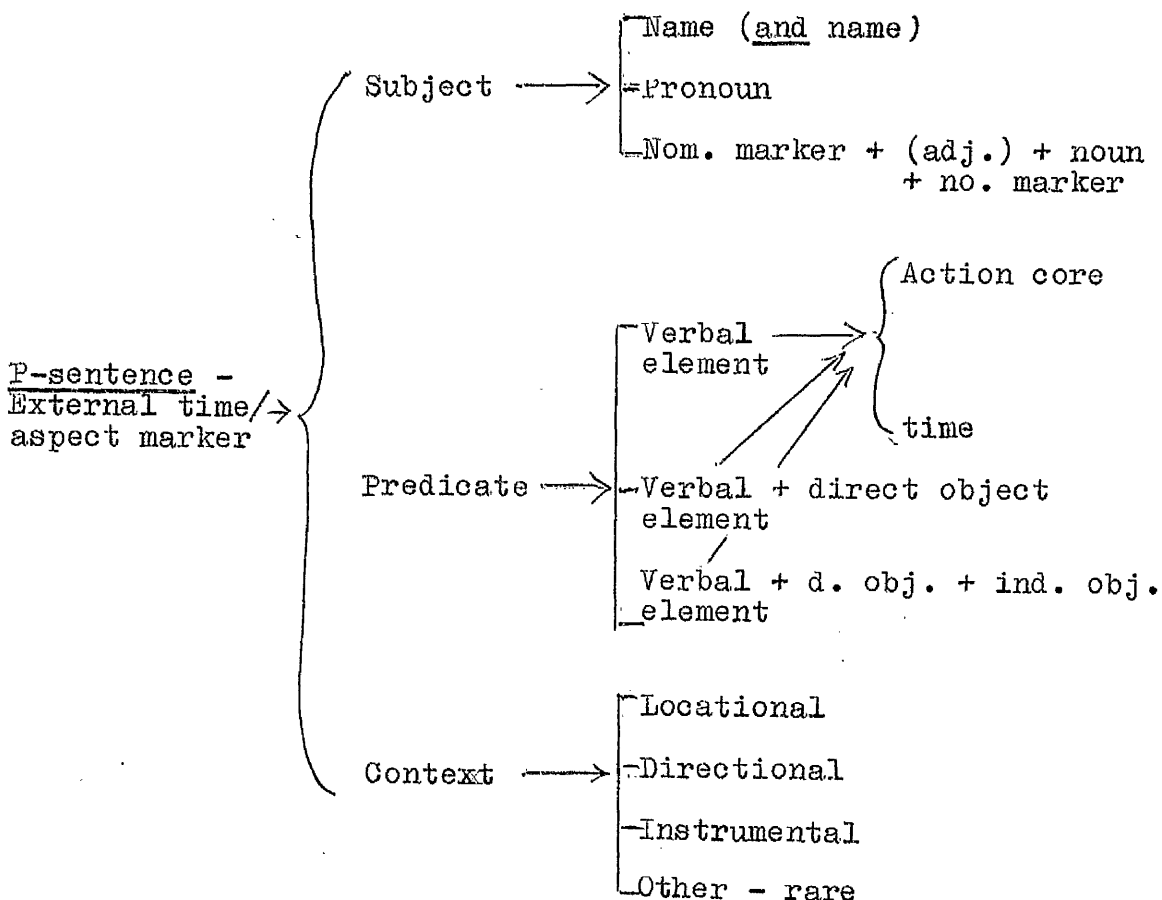
Negative = S + Att. core + NEG + ....

NEG. is usually identical to form in P-sentences.

## Stage 2

This appears to grow naturally out of Stage 1 by way of an intermediate stage of considerable variability, in which number-marking in nouns and time marking in verbs are unstable and imprecise. At its fullest development, in Stage 2, these minor structural details are more stable and certain in their use. Adjectives become more common. However, there is still considerable uncertainty in pronoun usage.

### (a) Performative sentences



- (Notes: (i) direct and indirect object phrases are very similar to subject phrases but with rarer use of the nominal marker.
- (ii) nominal markers = the (occurring more frequently in subject phrases), a (rare in subject phrases), some.
- (iii) the order of occurrence of direct and indirect objects is variable, and use of the preposition to is often idiosyncratic.
- (iv) context phrases usually consist of a preposition and noun phrase. The prepositional system is rather primitive (see Chapter 6).

Negatives and interrogatives are similar to those in Stage 1.

Where internal-marking of time is used, as in the case of an auxiliary + verb, then NEG. tends to occur between these two elements of the verb phrase. However, this is by no means a regular rule in even the most advanced of the children tested.

(b) Attributive sentences are very similar to those in Stage 1, but there is beginning to appear a separation into possessive sentences (with have) and true attributives (with be). There is still much confusion between these and a tendency for unit-verb use to persist even where it is being abandoned in P-sentences.

Perhaps the most fruitful and interesting discovery that arises out of use of the controlled elicitation method is that of unit verbs or unit A/C's: verbs (A/C's) in which the form (which may be constant across all verbs or vary from verb to verb) bears no consistent relationship to time or aspect reference. These unit verbs appear not only in simple but also in extended sentences. Thus for one child swimming may be a unit-verb, appearing in conjunction with present,

future and past time-markers:-

I swimming tomorrow

Yesterday we not swimming

When we swimming

(It will be recalled that forms like this form are of the largest of Myklebust's "deafisms" and are reported by Taylor (op.cit.) amongst others). Taylor has characterised:-

He cannot know how to swimming

as exhibiting confusion between infinitive and gerundial usage. A more parsimonious explanation is that swimming in Deafish is neither infinitival nor gerundial but a unit verb. Taylor's example is a clear exposition of the dangers inherent in importing grammatical concepts from one language system into another.

A similar intersystemic confusion can be seen in attempts to apply Crystal's descriptive framework, derived from English, to Deafish (Crystal et al., 1976), as was done by Bamford, (Bamford et al. in press). Here, a sequence like the boy has been classified as determiner + noun, but, as we have seen the in Deafish seems to have rather different implications than the normal English determiner. In the paper of Bamford and Bench an example of "English" produced by one of their subjects is given. The verbs in this all have present-

appearance and there it seems to be assumed that they have present-reference. Their data records numbers of verbs ending in -ed (which in English would, in most cases, indicate either past time or unfulfilled probability) and verbs in the future. The assumption must surely be that these workers assume without any evidence the time-reference system of their deaf subjects to be identical or closely similar to that of normally hearing children.

Other useful discoveries are:-

(1) the existence of pseudo-forms in a wide range of grammatical environments. Such forms may give, as in the examples discussed above of pseudo-causals (pp.317 ff), an air of nonsensicality to many utterances of deaf children. When, however, it is recognised that these do not represent "wrong" causals, but merely rather pretentions substitutes for the more frequent concatenative and, the utterances become rather less bizarre. An important point too, is that (if Vygatsky and Piaget are correct) this use of pseudo-causals, and probably of other pseudo-forms, is a normal stage of development, and it may be that we do injustice to the children by labelling such structures "pretentious".

Two propositions, A and B, may occur in either order and linked by and without serious risk of misunderstanding.

John is in hospital and he had an accident

means much the same as

John had an accident and he is in hospital

although the second, mirroring the sequence of events is perhaps rather more usual.

John had an accident because he is in hospital

may, as suggested above, be nothing but a pretentious parallel of the immediately preceding example, or it may reflect a nascent sense of causality.

A causes B.

This stage may well precede acquisition of the English syntactic structure which reverses A and B.

B because A.

At present we can do nothing but draw attention to these contrasting explanations of pseudo-forms: choice between one or the other will depend on more extensive research.

(2) the "homethnic" approach adopted in this analysis allows us to examine extended sentences in the same way: one rather more meaningful than attempts based on normal English stylistic and syntactic assumptions. A number of extended sentences have



been quoted and described briefly in Chapter 6. A rather larger number of such sentences was given in the spontaneous data, although even here they tend to be subordinate to simple sentences within the group as a whole. Data based on groups may be misleading: the majority of children used very few extended sentences and some used none, while a minority of children were much more adventurous. In some cases almost all of a text might consist of extended sentences. Examples will be given later of this contrast.

In Chapter 6 a number of extended sentence patterns were given: conjoined sentences with and without conjunctions, contrastive conjunctions (using but), causal sentences and so on. These forms occur also in the spontaneous data and will be discussed in turn.

#### Conjoined sentences

##### (1) Pseudo conjunction.

A rather small number of these occurred. The main point about these is that, deletions in the second simple-sentence elements of the extended sequence obscure the subject of these elements:-

Mummy and David walked and held mother's hand SW

Mummy carried David and sit in trolley SW

The strategy used here may well be identical with that advanced

earlier to explain apparently erroneous relativised sentences: each sentence is treated as a set; the extended sentence is equivalent to a union of these sets, with only one occurrence of any individual element. In the case of the first example:-

A = Mummy and David walked

B = David held mothers hand

. . AUB = Mummy and David walked and held mothers hand

Elsewhere the apparent anomaly arises from incorrect recognition of semantic set and sub-set relationships:-

I watched the film and the television DG

Trudy and I played the game and Mastermind DG

I and Daddy went to see a model railway and see live steam JC

Another type of pseudo-conjunction has already been described: the use of but with contrastive implications, where and would seem more appropriate. Several examples can be found in the spontaneous data:-

On Sunday I will go back to school but Clare is birthday  
tomorrow SH

Mother cooked our dinner but I can smell the turkey SS

They eat some nice food but it was very nice lunch AA

(2) Real use of similarity and contrastive conjunction.

In addition to these pseudo-forms a number appear in which and and but are used in different directions:-

but

We had dinner with my sister but my mother, father went out to dinner (CC)

Bridie smelt the green all the time. Bridie but with me (MS)

and

They are finished the home and family very happy (BP)

He through his window and climbed down on the floor (SW)

Through, here, appears to be an A/C word, as defined above, with unit-verb status.

An interesting contrast appears between the use of and and but. In the case of the former, "true" ands occur in 88 separate extended sentences. In some cases there may be two or three examples in a single extended sentence. There are only 6 examples of pseudo-ands. In contrast, we find 13 cases of pseudo-buts and only 5 examples of but used contrastively. This may be evidence of the suggestion in Chapter 6, that conjunction is initially a mere linking. Later this linking splits into what may be called similarity and contrastive conjunction, the latter developing through the pseudo-stage described here.

(3) Conjunction by juxtaposition.

Only a limited number of samples appear in the spontaneous data:-

<u>The cat is neught scratched her hand</u>	LT	
<u>I saw my mummy arm red my friend back red</u>	PI	
<u>We go to play with my friend make her laughter all the time</u>		CC

In general conjunction by juxtaposition is confined to the children in the lowest stage of development described. This may be evidence for its prior appearance, as one might suspect from its primitive nature, but the half-dozen or so examples that occur are too few to enable us to reach any firm decision.

Causal sentences

Once again, both causal and pseudo-causal sentences occur, the former outnumbering the latter by about four-hundred percent.

1. Pseudo-causal sentences

<u>Jane putting a blanket on the grass because the food stand on the blanket</u>	SS
--	----

<u>Last week Saturday I went to the shopping because I buy a some shopping present Christmas</u>	LT
--	----

(LT's language, in both elicited and spontaneous samples is one of the most primitive of the whole group. Several of her sentences appear to have been contaminated by manual language forms - as in last week Saturday and present Christmas. On the other hand, these forms may merely arise from the omission

of prepositions, which is characteristic of the lowest stage described: last week (on) Saturday and present (for) Christmas would appear with insertion of appropriate prepositions. Of course, as shown above, omission of non-concrete, directional and locational prepositions is a regular feature of Deafish).

## 2. True causal sentences.

A wide range of true causal sentences is used, involving both changes of subject and maintenance of identical subjects in the two joined simple sentences:-

### because

(a)  $S_1 V_1 \wedge S_2 V_2$  : (9 examples all told)

Mother was cry because Lee has beeing lost BP

(b)  $S_1 V_1 \wedge \overset{\text{because}}{S_1} V_2$  : (14 examples)

I cannot get out of the hole because I got a broken leg BP

I cannot sleep well because I was getting too excited JC

Mrs. Cook brought a small chair because she was reach a window RS

In these examples cannot functions as a unit verb and was acts as a past tense marker.

## Relativised sentences

Altogether 37 relativised sentences occur in the spontaneous data, produced by 18 of the 20 children tested. Thus, although

relativised sentences are comparatively rare, forming about  $1\frac{1}{2}\%$  of the total, nearly all children can use them.

Interestingly, none of the spontaneous relative structures depart from the simple set-theory model advanced earlier:-

<u>I saw the boy played the firework all over</u>	(BP)
<u>The lady picked of the food is on the table</u>	KB
<u>The policeman heard the boy screamed</u>	MW
<u>John bounced the ball bounced on the flowers</u>	LT

Some of the relativised sentences are disguised because of the commonly missing attributive-core word (whose position is marked in the following examples by  $\phi$ ):-

<u>I saw the watch <math>\phi</math> brown and gold</u>	AP
---	----

In a small number of cases this relativising structure may give apparently "correct" English sentences:-

<u>Henry watched the men move all the furniture</u>	MW
<u>Mary and John watching Mother put lots of food in the brown basket</u>	JH

The last three examples above provide some of the most telling evidence in support of the controlled elicitation method, which has enabled us to analyse in some detail the existence and functions of unit verbs, delayed development of be and other features. Without this knowledge the last two examples

may have been taken as correct or nearly correct samples of complex English sentences. They would contrast strikingly with other examples of MW's and JH's language, providing difficult problems of interpretation. AP's sentence would be interpreted (and has been so interpreted by a number of teachers of the deaf) as contaminated by manual syntax, in which the head-word in a phrase occurs first. The four preceding examples would be categorised as "wrong", as would the other 30 or similar sentences.

In fact we see that the apparently "wrong" forms are standard Deafish and that AP's sentence is also normal in Deafish terms. The two apparently correct forms are only fortuitously so: Deafish relativised clauses containing unit verbs may come to resemble some normal English forms by chance. But, far from contrasting with their other sentences, MW's and JH's examples are all of a piece: no apparent anomalies exist to be explained away.

One striking feature of relativised sentences that contrasts with the causals is that in all examples it is the object of the first sentence (co-referential with the subject of the second) that provides the link-element. In no cases do we find attempts at relativising the subject of the first sentence. Indeed, if the suggested explanation is correct (i.e. that the children appear to use some form of probably unconscious set theory formulation) then it is difficult to see how the first subject could be relativised

without causing ambiguity. In these cases the strategy that is favoured appears to be conjoining, with or without deletion of the co-referential subject.

### Temporal complexes

Just as in the elicited sample, we also find a number of attempts at expressing time relationships within different sequences of sentences. These are very rare and some pseudo-forms occur. These pseudo-forms consist of the use of an imperfective marker with no contrasting perfective verb:-

When we went back to school. AA

While I ate my tea. SS

A more extensive example can be seen in:-

While we gone to bed and I bring tabby to my bedroom and  
slept in my bed and I read Mandy and Tommy and Dandy while  
I had half sleep and let the light out. SS

In these and the other examples that can be found when and while seem to imply then or next.

Another example of an apparently pseudo-form is seen in until in:-

Until I have tea at deaf club and at 1130 I will go home SS



Once again until seems to mean then.

Other examples show clear attempts to mark the passage of time or to achieve contrasts:-

After that I went home for tea then I watched television FR  
On Sunday I will clean my bedroom before I will back to  
school RS

In the same way we find a few children, usually the most advanced, attempting to indicate true aspect differences:-

When I came home from minibus on Friday Clare, Maureen,  
Suzanne and I saw aeroplane damage SS

and

.... came to my house to play while I was in bed FR

Mood, in the sense of indicating possibility is usually marked by use of perhaps:-

Perhap I went to the swimming pool today DG

(went is a unit verb here).

Saturday morning perhap I will see my friend CC

These examples of extended sentences taken from the spontaneous samples find parallels in the elicited data and provide additional supportive evidence for the validity of the controlled elicitation sampling. As we have shown passim they become easily comprehensible when approached from the standpoint of Deafish: apparent anomalies, especially in verbal usage and form disappear when examined with unit verbs in mind. So too does the strangeness of:-

My daddy pushed me fell over in the water

JH

Questioning established that it was JH who fell over. The frequent confusions in pronoun usage discussed in Chapter 6 show that me and I are not distinct forms but are almost in a state of free variation. Looked at with this knowledge, JH's sentence becomes normal Deafish in structure.

Not only does our analysis demonstrate the regularity of these macro-sentence structures, but in turn these can be used to analyse more extensive texts, which will be attempted below.

Before attempting this, however, there are a number of outstanding points to be examined. In general these represent some linguistic patterns which the elicitation method did not bring out clearly.

Expressions of intentionality

This term is used in rather a loose sense to cover a wide range of subordinated verbal constructions, and takes its name from a common pattern in Deafish and English:-

At 1.0 p.m. Dad pour the wine in the glass to say Merry Xmas SS

On Sunday morning Julie came to my house to play PR

and, with unit verb usage:-

Mother came to saw John LT

The boy sat in the trolley to walked in the shop BP

In some cases the rather restricted set of Deafish simple sentences, with pseudo-forms of function verbs convey an air of clumsiness:-

His mother and father were very busy to take all his furniture out of the van DP

Here take is probably a unit verb, very represents a legitimate developmental confusion (I am very busy and I am too busy said by a parent or teacher to an importunate child amount to very much the same thing) and his reflects the common confusion in use of pronouns and adjectives. These suggestions of error and confusion are however almost certainly ethnocentric: in Deafish very and too may be interchangeable, while the function of personal pronouns and adjectives seems mainly to indicate possession or a similar relationship: the rest of

the sentence specifies the exact nature of the relationship and the party or parties involved.

Father telephone to the men for bring thing to move the house MB

is another apparent clumsy structure. For is difficult to explain but it contrasts with the dative of to the men. In Ivimey and Lachterman (op.cit.) it was suggested that directional to, dative to and pre-verbal uses of to form a hierarchy of difficulty and this may explain the apparent anomaly of for. It contrasts with the following use of to because it seems to be less clearly a mark of intentionality.

Use of "intentional" to is not by any means well established in the group as a whole, since we find examples of its omission, as well as its occurrence:-

omission:

I been down to the shop buy a toy BP

On Saturday morning I went to Worthing do some shopping FR

occurrence:

On Saturday Daddy, Mummy, Bridie and I went to see Nanny Plaisted DP

We went to see David Warner AA

In all six sentences occurred without intentional to where it would be expected. It does occur in seventeen sentences. There is some tendency for it to be omitted by children in

Stage 1 and for it to be used by the more advanced children, but the distinction is very unclear.

A similar confusion between presence and absence of to is found in the case of like (absence - 1; presence - 3), ready (absence - 1; presence - 4; with for - 3), want (presence - 5; absence - 5) and help (absence - 3; presence - 2). In the case of help both forms are acceptable in English:-

- a) I would like have a radio SA  
I would like to makes a pretty Christmas tree CC
- b) Daddy and I helped Nannie garden ready for the winter AA  
On Saturday I got ready go back to school SW  
They are ready to going for a walk AA  
I put it in the box to ready to move JC

(In three cases ready functions as a performative A/C word).

- c) I want to buy some a drink DG  
He want to go to Scout SS  
You want have a look at New House for Sale SW  
Peter and Jane want go for a walk MB

In these examples the initial subject is subject of both sentence-elements. Where  $S_2$  is identical with the object in the first sentence element, the form closely resembles relativised sentences:-

I want Frances come

MB

d) I help put some food in the picnic basket

AA

Help me look the mouse

TW

Then Peter help to fetch the carpet

MB

On a numerical basis, intentional to appears to occur about  $2\frac{1}{2}$  times as often as it is omitted and may represent a fairly stable, if still developing, structure in Deafish extended sentences.

#### Analysis of extended texts

The insights that detailed analysis of data obtained under controlled elicitation conditions enable us to approach the problems of interpreting extended texts in Deafish. Before doing this it must be stated that, in the author's opinion there is little justification for expecting profoundly deaf children, even as old as 13 years, with language skills that may resemble in some ways that of very young hearing children, to write stories, diaries, and essays. No-one would expect such a feat from a three-year-old, and it is not surprising that the style may appear clumsy, the matter trite and the sequences confused. When one fully realises the extent of the linguistic handicap under which these children operate one ceases to think how "poor" their "English" is, but admires the efforts they make to communicate often quite complex series of ideas:-

TW: The boy get 50p  
The mouse is 40p each  
The boy said yes for me please  
The lady said thank you  
The lady gave 10p left

TW's account of a shopping expedition to purchase a toy mouse that subsequently terrified the teacher, relies purely on sequence of sentences to reflect the thought. A rather similar device is used by DP who achieves a rather dramatic sense:-

First Warren ran away  
Second Bryan ran away  
Third I ran away  
We went over the road  
We went back to the field  
We went home

In the absence of any clearly developed system of time and aspect marking, it is difficult to see how any more sophisticated stylistic structures could be used.

One major outcome of these (and the following) examples is that the earlier categorisation (in Chapter 1) that the language of the deaf often seems to be confused in its presentation of ideas, can be rejected immediately. Where the ideas are clearly structured, their expression is often quite accurate. The confusions reported by earlier

writers may have arisen from the nature of the task the children had to perform: frequently this was a recital from memory of a film or story. Under similar conditions it is not unusual for even sophisticated, adult language users to appear muddled and incoherent in their accounts.

The quotations already made reveal some clear aspects of Deafish style: repetition of the subject (or occasionally of a nominal object phrase) in full from one sentence to another, a reliance on short, simple sentences and the apparent dislocation of time sequences through use of unit verbs, and still more (as in the following example) by use of a verb in two forms apparently in free-variation:-

BP    The boy bike it was 10 speeds    (an initial assertion)

I said "it is not 10 speeds

I said "it was 3 speeds

He said "That is right

I said "I got 5 speeds

He said "Very good

In Deafish, disputation is carried on by assertion and counter-assertion. In this language sample we have no evidence as to how such a dispute could be resolved, except (as seems to be the case here) by an appeal to objective reality - i.e. pointing. An alternative solution may lie in the degree of vehemence of the various assertions!



These fragments were taken from the writing of children in the most primitive stage of development described here. Examination of a complete text brings out clearly some aspects of Deafish stylistics.

Table 8.1

Continuous text analysis (1)

Sample: DG

Tommy and the Toy mouse

Tommy went to the deaf children school in London (i) (ii)

Sometimes Tommy is very naughty (iii)

Tommy went to the shop mouse

---

Notes: (i) Characteristic early stage omission of 's in Deafish.

(ii) Goes may be more appropriate:-

went = unit verb

is = unit verb

(iii) Either (1) a rare example of manual influence  
= mouse shop, or

(2) omission of non-directional and locational preposition (for) with limitation in use of the in contiguous noun phrases.

The girl heard what is the matter

- 
- Notes: (i) Heard: ask/tell/say/hear confusion? Unit verb
- (ii) What is the matter: a learned unit apparently appropriate here. Meaning = What are you doing?, What is going on?
- 

The girl look at the mouse

- 
- Notes: (i) Look at = unit verb
- (ii) The girl = repetition in full of nominal marker
- 

The girl screamed

- 
- Note: screamed = unit verb
- 

The teacher said "Tommy come to me.

- 
- Notes: come = unit verb
- Inverted commas only at beginning of speech segment is very characteristic of this group.
- 

The teacher smacked on the bottom shoes

- 
- Notes: (i) smacked: unit verb
- (ii) use of only one nominal marker in contiguous noun phrases.
- (iii) shoes: confusion between singular and plural.
- (iv) omission of non-directional/locational preposition.

The teacher was frightened

---

Notes: (i) Sentence probably misplaced. Could more reasonably be expected to occur two sentences earlier.

(ii) Repetition of noun-phrase in full.

---

It must be emphasized that the comments in the "notes" are in no way intended to explain away seeming errors, but instead to demonstrate that many of these errors cease to be so when judged against a background of Deafish.

Many similar features can also be detected in the writing of children in the more advanced stage, although here we find rather longer texts and a tendency to use a greater number of extended sentences, attempts to indicate the passage of time and other stylistic devices. In contrast to this clear advance in the expressive use of language we continue to find a persistence of unit-verbs, confusions in personal pronouns and adjectives<sup>x</sup>, use of non-English grammatical categories and all the other elements described above contribute to an air of semantic and syntactic dislocation. This

---

x These personal pronoun and adjective confusions may only be apparent when judged against English. They may have, relative to English a similar status to the French son and sa, in which sex distinction is missing, to be supplied by other elements in the sentence:-

Il aime sa mere

Elle aime sa mere

Sa here indicates a relationship. Details essential in English but not French of that relationship are supplied by il and elle respectively. It may be that Deafish equivalents are similar.

may be increased by the use of non-English conjoining and other strategies used to produce extended sentences.

Table 8.2

Continuous text analysis (2)

Sample: FR

What I would most like for Christmas and next year

---

Note: Title supplied by teacher

---

On Sunday 20th I will decorations for Christmas. Grandad and I would buy a tree for decoration on the tree.

---

Notes:(i)decorations is probably a confusion between a Deafish performative A/C (see next sentence) and a nominal ,

(ii) For is one indicator of intentionality in Deafish and decoration here is an A/C;

(iii) On the tree is a stylistic repetition of full noun phrase rather than a vacuous repetition.

---

On 22nd December Grandma and I will going to Worthing to do some shopping for Christmas

---

Notes: (i) going = unit verb

(ii) use of directional and intentional to.

---

I wrapped up with red wrapping paper around the basket

---

Note: With is non locational and non directional - frequently misused in Deafish.

---

On Christmas Eve my other family are coming to my house for Christmas to stay for 4 days.

---

Notes: (i) directional and intentional to  
(ii) for Christmas probably a learned phrase - it occurs in the title, but is fairly commonly in use.

---

Then I go to bed at 11 p.m.

---

Note: Then to emphasize sequence of time.

---

Then the next morning it is Christmas day

---

Note: At this stage overt future marking of the A/C word has disappeared.

---

I was very excited on Christmas day and all the lovely presents

---

Note: and links 2 sentence elements of which the second is characterised by absence of non-concrete preposition (I was very excited with all the lovely presents).  
Note punctuation.

but next year I wish I had for Christmas is typewriter and more fashion dresses and fashion coat.

- 
- Notes:
- (i) Probably a true contrastive but
  - (ii) Does next year refer to the following Christmas or does it concern the Christmas under discussion - I would like to have had?
  - (iii) Wish is probably a unit verb (for wished?) and in the absence of a model system, this is all that can be achieved.
- 

FR is one of the most advanced of the children tested and we can see that her sentences are quite flexible. In Deafish terms, i.e. accepting the characteristics of the system, there is only one ambiguous sentence: the last. Given skills at this level of development, this is quite a striking achievement.

RS, in contrast to FR, although in the more advanced group, uses mainly simple sentences, exhibiting many of the features discovered earlier.

### Table 8.3

Continuous text analysis (3)

Sample - RS

The new house

Mr. and Mrs. Cook and his son looked a new house for sale.

---

- Notes: (i) his son: pronoun confusion  
(ii) looked: for looked at  
(iii) a new house: occurrence of a in object phrase?  
(see below)
- 

The new house was lovely

They went to look around his empty room

The floor was old wood

---

Note: his: personal pronoun/adjective confusion (see note above)

---

The woodworm eat a wood

The window was six glass

---

- Notes: (i) eat: unit verb  
(ii) a wood: use of a in object phrase  
Confusions of be/have; uncertain marking in nouns for number.
- 

his son was named Matthew

---

- Notes: (i) note punctuation  
(ii) Stylistic "irrelevancy" or poor ordering, noted by Heider and Heider  
(iii) his son: pronoun/adjective confusion
-

Matthew tell a removal van

---

Notes: (i) tell: unit verb  
(ii) a removal van: use of a in object phrase

---

The man said "Where is your house"

---

Note: Question: rote-learned form?

---

The removal van was following with Matthew

---

Note: Stylistic gap reflecting conceptual gap.

---

It is very slowly

---

Note: Is: uncertainty in use of be (lags behind performative A/C's).

---

Matthew watched a man

---

Note: Use of a in object phrase

---

A man carried a furniture

---

Note: Repetition of noun phrase in full: use of a in object phrase.

---



It is very busy

---

Notes: (i) It: pronoun confusion?  
(ii) Is: as above. (p.402)

---

Matthew was a lazy boy because he was not be help him

---

Note: Probably pseudo-causal.

---

They went to go in the van.

The van went to new house.

---

Note: Repetition of noun phrase (the van) in full.

---

Mrs. Cook brought a small chair because she was reach a window

---

Notes: (i) Because here may also be a pseudo-causal.  
(ii) Intentional to would be expected.  
(iii) was: past marker with unit verb reach.  
(iv) a window: use of a in object phrase.

---

Mrs. Cook put a curtain by window

Mr. Cook brought a hammer and a nail for picture

---

Notes: (i) a curtain: use of a in object phrase.  
(ii) by window: (see to new house, for picture)  
omission of nominal marker in several prepositional, context phrases.

---

The picture was stand on the wall

- 
- Notes:
- (i) nominal marker used with in, into, on, i.e. most concrete prepositions.
  - (ii) To new house appears anomalous here and may be an error within the system of Deafish.
  - (iii) was stand: was = past marker with U.V. stand
- 

Mr. Cook banged a hammer into a nail

- 
- Notes:
- (i) Into: error in the system?
  - (ii) a: used in object phrases
- 

The nail went through a wall

- 
- Notes:
- (i) through = into would be more appropriate
  - (ii) a wall: object phrase a
- 

Matthew carried a box of toys

---

Note: a box: object phrase a.

---

A box of toys put on the other room

- 
- Notes:
- (i) A box of toys: complete noun phrase repetition.
  - (ii) put: probably unit verb.
  - (iii) on: preposition confusion.
-

They were very happy and pleased with new house

The end.

- 
- Notes: (i) happy and pleased: pseudo-and, achieving  
tautology.
- (ii) with new house: omission of nominal marker  
in prepositional phrase.
- 

In this passage we can see one or two conceptual leaps, perhaps justifying the Heiders' characterisation of texts as consisting of sequences of un- or ill-ordered sentences, but for the most part there is a clear progression of thinking.

In some cases possible unit-verb status has been suggested. Many of the other A/C's with past-tense form may also be unit-verbs: the correlation between form and time reference may be accidental.

Other notable features are uncertainty in use of personal pronouns and adjectives, the tendency for noun-phrases to be repeated in full and the tendency to confine a to post-A/C positions (object and context phrases) and the to subject phrases. Two examples of a in subject position can be found, but these can be explained on the basis of the noun-phrase repetition device. In contrast the occurs three times in post A/C position. This may indicate an early stage in the development of normal English deixis. However the sequence:-

Matthew tell a removal van .....

The removal van was following with Matthew

which appears, in its sequence of indefinite - definite articles, to be "correct", may only reflect the differing status and privileges of occurrence of nominal markers in Deafish. A similar explanation may underlie the earlier sequence:-

Mr. and Mrs. Cook ..... looked a new house for Sale

The new house was lovely.

Although these analyses of texts can only be tentative they bring out two facts very clearly. In the first case, many apparent errors are only such when viewed from the standpoint of normal English. Apparent misuses of tense-sequences, prepositions, pronouns, adjectives, articles and the rest disappear when the rules of Deafish become the criterion. The second point is that, application of measures like the type-token ratio or, at a more sophisticated level, of Crystal's diagnostic instrument, may be difficult. Such procedures make sense only when the language to which they are being applied is identical to the language on which they were developed. The evidence available here suggests that this may not be so.

The relationship of Deafish to juvenile or infantile English

Many writers, including the author, have asserted that the syntax of Deafish resembles that of normal English as used by very young children. The author has compared Deafish negative, interrogative and other mesostructures with those of Adam and Eve (Bellugi and Brown, op. cit.) and hearing children learning English as a second language (Ivimey, 1977(c)). In most cases the basic generative rules seem to be similar and the sentences are often identical. Taylor (op. cit.) makes much the same point, as do Quigley et al. and Jarvella and Lubinsky (opera cit.). It was argued, however, in Chapter 2 that these findings are suspect, since the investigators carried out their analyses with English transformational models in mind. The conclusions are as tautological as they are expected. In contrast, a number of earlier workers have adopted the position that Deafish is a language suu generis. Blanton suggests this: "It is very rare that a deaf person learns to use English generatively" (Blanton et al., op. cit. p.100). The Heiders make much the same point:-

It seems more likely that the difference between the deaf and hearing cannot be fully expressed in quantitative terms as the degree of retardation and that they represent differences not merely of skill in the use of language but in the whole thought structure".

(op. cit., p. 99)

Moore reiterates this point (op. cit.)

The approach adopted in this investigation has attempted to approach this problem from a neutral position: the language sample has been analysed, as far as possible, in neutral terms, thus preventing tautologous conclusions. Thereafter the results of analysis can be compared with other systems.

We do find some striking similarities between some of the syntactic structures and lexical features described here and some descriptions of the early stages of development in normal English.

A number of lexical confusions have been noted in passing: use of English adverbs, prepositions and even nouns appearing as Deafish A/C words, confusion between ask and tell and the frequent occurrence of pseudo-words. This has been shown to apply also to the language of rather young hearing children (Bowerman, 1978, Chomsky, C., 1969; Clark, 1973).

There is also a broad similarity of rule usage in negative interrogative and other sentences between the deaf adolescents described here and hearing children between the ages of three and seven. Menyuk (1971), for example quotes some sentences of a hearing child aged nearly three, which could be found in adolescent Deafish:-

He playing the piano

He nice

When you eat them?

He not going

He goes work

(op. cit. pp. 135/6).

But other similarities she labels "incorrect" or "deviant", and sentences like these too occur frequently in the language studied in this investigation:-

A boys were there

I want many soap

I want going to the store

He flies on the sky

(ibid.)

In another work (Menyuk, 1969) she asserts that:-

In addition if we look at the Wh-Question, Negation and Infinitival Complement constructions of the deviant-speaking population we see that there is not much difference between the 3 year-old's productions and the almost 6 year-old's productions.

(op. cit. p., 129).

Examples quoted by Menyuk are:-

<u>Age</u>	<u>Question</u>	<u>Negation</u>
4,0	Why you put?	He did not like Tippy
5,1	What you do with this?	
5,11		Blacky not talk

Menyuk's conclusion is that rather than "stating that these children's language production was infantile or slower in going through the normal course of development, one is led to state that their language production is arrested at some stage of development" (ibid. p. 130). Since some of the sentences of the 13 year-old deaf children resemble the examples above, this would, according to Menyuk, be strong evidence for postulating an arrest of language development in their case too. Against this must be set the evidence in this thesis that, even though the sentences of the deaf aged 10 and 13 years are still "wrong" in normative terms, yet one can detect a steady, if slow increment in the ability to communicate detail. The term "arrest" as used by Menyuk may be too dramatic and may do little more than reflect the crude nature of her naturalistically obtained language sample and her T.G. based analytical model.

In fact although rather similar general rules may be used, (viz.: in negation, preposing the exponent of NEG to the verb; in interrogatives preposing the exponent of Q to the declarative sentence treated as a unit) there is a curious but widespread mismatch in detail between Deafish and infantile English. The rules may be the same but the actual forms do not always closely resemble each other.

Perhaps one of the greatest differences between Deafish and infantile English can be found in the category of unit-verbs. Few writers have reported these in their work although Brown (1973) seems to have been hinting at



something very similar. In the analysis of verbal forms ending in -ing he writes:-

All present forms refer to action and events of temporary duration, but since these do not contrast with permanent, instantaneous and timeless action and events, it is not clear that "temporary duration" is part of what the child intends to express.

(1973, p. 319).

Rather earlier Brown showed how a single unmarked form can be understood in one of four meanings: (a) imperative, (b) past, (c) intentional or predictive, (d) progressive with present duration (ibid., pp. 317-318). These examples resemble very closely the unit-verbs as described here.

Absence of similar forms in other reports of developing English may be explained by their non-occurrence, because researchers have not noticed their occurrence (which is likely to occur if workers bring ready-made analytical models based on adult language to the study of child language), or because a reliance on recorded samples of spontaneous language has been misinterpreted. That this is possible can be seen in the case of some utterances of a three year-old daughter of a colleague of the writer. The little girl was playing on the floor when she saw the family au-pair girl pass the window:-

Here's Vicky

(Pause. Doorbell rings. Pause)

Who opened the door?

Had this been recorded it might be that the child would have been credited with rather accurate knowledge of English past-time marking. But the door had not yet been opened. The child appears to have intended:-

Who is going to open the door?

This instance would be a candidate for unit-verb status, but could easily have, in the process of recording in the absence of an alert adult observer, been mis-interpreted.

Frequent occurrence of similar unit-verb usages in developing English would provide strong evidence for a congruence between adolescent Deafish and infantile English. At present the evidence, on which a decision could be founded, does not exist.

However, the sort of evidence that is advanced to support the argument of a massive delay in the development of syntactic competence of deaf children suffers from a serious defect: it is not exactly clear just what features are being compared with what. Thus the rules for negating propositions used by 10 - 13 year-old deaf children may be similar to those of hearing 4 - 6 year-olds, as in Menyuk (op. cit.) and such a similarity may be taken as evidence of a developmental delay in the deaf. So too, the possibility that hearing children use unit-verbs will also be taken as

supporting evidence. The dangers of making careless parallels on the basis of superficial, impressionistic judgments can be easily demonstrated. Brown's description of one stage of language development describes rather accurately the syntax of deaf children in Stage 1 as described here:-

the .... sentences for the most part express the semantic roles or relations we have called agent, experience, beneficiary, patient, location and so on .... Modulations and modalities are either totally missing or only present in primitive germinal form.

(Brown, op. cit., p.40).

Yet this refers to Brown's Stage I, characterised by a M.L.U. of 1.75 with an Upper Bound of 5 words. But the M.L.U. of the children studied here is greater than that in Brown's Stage V. Since the linguistic and cognitive differences between children aged  $1\frac{1}{2}$  or 2 and 4 or 5 years are great the value of comparing, on the basis of different syntactic features, older deaf children with very different groups of younger hearing children is questionable. If the match between groups were real one would perhaps more reasonably expect a congruency of delay over several different features between the deaf and a single, fairly homogeneous group of the hearing. In contrast, one might expect to find some overlap of characteristics when comparing two groups both of which are developmentally ill-defined and cognitively and linguistically heterogeneous, but these overlaps may not be

linguistically significant. They may be fortuitous or they may arise in other ways.

In an earlier paper (Ivimey 1977(c)) Ivimey suggested that it may be useful to see deaf children as passing through the stage of interlanguage as described by Richards (op. cit.) and others. One of the essentials of interlanguage, i.e. of any early stage in the acquisition of English as a second language ( $L_2$ ), is that a large proportion of "errors" appear to be systematic and independent of the native language ( $L_1$ ) of the second language learner. A smaller proportion of errors can be traced to contamination by  $L_1$ . Thus, although there may be broad similarities between the interlanguage of two children from different  $L_1$ 's, there will also be considerable discrepancies in detail. It is proposed here that interlanguage may represent a developmental stage in the acquisition of any language, whether  $L_2$  (a second language) or  $L_1$  (the mother tongue) and that, in the case of  $L_1$  acquisition, while there will be many similarities between different  $L_1$  learners there will also occur a number of discrepancies. In these cases the discrepancies will not, of course, arise from contamination by  $L_1$ , since there is no  $L_1$  (the children begin from what is virtually  $L_0$ ). They will be purely due to the differential language behaviour of parents, other adults and children which forms the data on the basis of which the  $L_1$  learner must construct his rules, as well as to the learner's ability for language and possibly also his general intelligence.

Such a proposal would appear to account adequately for the differences and similarities noted between  $L_1$  learners with different cultural, socio-economic and educational backgrounds, as well as to the delay noted in the language development of identical twins. More specifically, it would apply to the deaf whose language input is both limited and distorted (Ivimey, 1976(b)).

What is being proposed here is that the similarities in interlanguage may arise from the application of species-specific inductive cognitive processes to language data. If these processes operate in similar ways in all (or most) human beings then the sorts of rules that they produce are likely to be broadly similar while the detail may be markedly dissimilar. There is some evidence that this is so in the case of a wide range of non-linguistic cognitive structures (Cole et al., 1971; Gay & Cole, 1967; Lovell, 1961). Application of Piagetian methods of investigating cognitive functioning and development to children in a wide range of very different cultures has revealed that children seem to pass through broadly similar stages of cognitive functioning to those reported by workers in North America and Western Europe, but the details of this functioning seem to be quite culture-specific. Of special importance is the finding that the sorts of cognitive activity encouraged by adults in different cultures seem to influence the rate of development and the final stage reached in cognitive development.

If this proposal is well-founded then one would expect to discover two different sorts of behaviour:-

- (a) in early stages of development, broad similarities and specific differences in language development;
- (b) a gradual divergence with subsequent development until adult behaviour appeared markedly dissimilar from one environment to another.

The first of these expectations is satisfied. The widespread occurrence of similar forms reported in research emanating from the U.S.A. and which has been used to determine the validity of the controlled elicitation sampling method used here is striking evidence for this point: Deafish rules of language appear to arise in a very wide range of educational environments making use of contrasting methods of communicating. There is at present very little actual evidence to substantiate or disconfirm the second expectation. The stylistic devices and overall impression left by the extended texts of Deafish analysed above look very different from those of normal English. Whether this is so, which would provide moderately strong evidence in support of point (b) above, or whether it arises from the unreality of expecting children with, say three or four year-old skills in language, to carry out language tasks appropriate to ten or eleven year-olds, cannot at present be decided.

## CONCLUSIONS

It has been shown that the controlled elicitation method of sampling language is valid, reliable and sensitive. It allows investigators to collect samples of sufficiently adequate size and with unambiguous reference to permit of meaningful analysis. The analysis which has been carried out in relatively neutral terms enables us to make statements describing regularities in the linguistic behaviour of the children. The statements are, in the Popperian sense, scientific in that they are potentially falsifiable and do not appeal to or depend upon hypothesized mental entities that are accessible only to the personal and private introspection of the investigator. On the basis of these scientific statements it is possible to make predictions about the future behaviour (i.e. the perception of language) of the children who provided the original data. These predictions have been confirmed by controlled experimentation. This confirmation both reinforces the scientific status of the original statements and provides some evidence, independent of the linguistic analysis, for the nature of a hypothetical language/cognition interface.

The analysis of the language sample allows us to reject the alinguistic theories of Furth, Fusfeld, Blanton and others: we can assert with some confidence that the deaf do appear to construct language rules, and these rules have been described in detail. They seem, in many ways to differ markedly from those of normal English, as used by hearing

children of the same ages as those studied. Whether these rules represent a retardation in the acquisition of normal English, or whether they reveal the development of a rather different system cannot at present be determined.

These conclusions provide at least partial answers to two of the fundamental questions outlined in the Introduction. The third, concerning the relationship, if any, between language and thinking has been partly answered, if only indirectly. The status of unit-verbs (or A/C's), defined linguistically, appears to have some reality psychologically; unit-verb users appear not to be accurate time-perceivers in a linguistic sense. This may, and one can be no more than tentative here, suggest that the mental processes of unit-verb users take place in only a crude temporal framework, as we have shown also in the case of the spatial (prepositional) framework. Gordon (op. cit.) has reached a similar conclusion in respect of the semantic framework of his subjects. Writing in a different context Waterson has expressed this point well:-

..... Increase in utterance length involves greater complexity not only in terms of the number of syllables within a word, or of words within a sentence but also in relation to the degree of differentiation or number of contrasts within the syllable, word and sentence.

(Waterson, 1978, p. 438).



There appears to be very little differentiation in Stage 1 and development is in the direction of achieving more precise differentiation of the elements that are linked together to form sentences.

It is significant that in Furth's experiments the tests failed by most of the deaf involved a form of fairly fine temporal sequencing (op. cit.). It may well be that Furth's findings support the view not that thinking and language are independent, but that they are, in fact, rather intimately involved with each other. This problem cannot be resolved here: only a properly controlled and designed investigation can do that. But, such an investigation will not be based on assumptions about the level or adequacy of linguistic functioning of the deaf children involved. The validity, reliability and sensitivity of the controlled-elicitation method of sampling language demonstrated in this investigation, will allow us accurately to assess the language systems of participants of such an enterprise.

#### Cybernetics and language models

It has been argued above (Chapter 4) that the controlled elicitation sampling technique is essentially cybernetic in form: the object to be studied is not susceptible of direct examination but demands a systematic approach. Merely to record spontaneous emissions from the object does not give enough clear data to allow observers to discover

unambiguously the structure (if any) that is contained in the object. A more rigorous approach is to vary systematically the inputs to the object and to record its outputs. In this way a fairly detailed specification of the internal structure of the object may be drawn up.

No claim may be made that the specification is identical or even only partly similar structurally to the contents of the original object. A strong claim, however, may be made of a functional isomorphism. The maps of the London underground system provide an excellent example of the distinction being made. They bear very little relationship to geographical reality but, in contrast, indicate functional relationships excellently. Structural isomorphism is negligible, functional isomorphism is almost perfect.

The descriptions of the language models at Stages 1 and 2 provided here enable us to compare, with some accuracy, the differential complexity of each stage, and it has been shown, in Appendix A, that this differential complexity is susceptible of quite accurate quantification. In Stage 1, only a rather limited amount of detail is able to be communicated: there are no time or aspect specifications, little modification of nominal phrases by adjectives or number-marking, and so on. There is, most importantly, very little possibility of macrostate complexity: communications tend to consist of sequence of short simple sentences. In contrast the flexibility and communicative power of models in Stage 2 are much greater (although still restricted when compared with younger

hearing children). Time differences can be indicated with some confidence, nominals are more accurately specified and may be modified adjectively. In addition the children with Stage 2 models have available metastate rules that allow the production of extended sentences and even some, albeit uncertain indication of aspect and other linguistic relationships.

Since these various levels of differential complexity and metastate rules refer clearly to the form of the utterances, whose propositional nature was held constant, there is some justification for asserting that not only is the sampling methodology cybernetic but so also is the resultant model of language functioning. Cybernetics has been defined as the art of control or direction. The formal input to the L.P.S. clearly has a control or directive function. The analysis carried out in this dissertation reveals that at different stages the complexity and fineness of detail of the control function not only vary but can be described.

APPENDICES

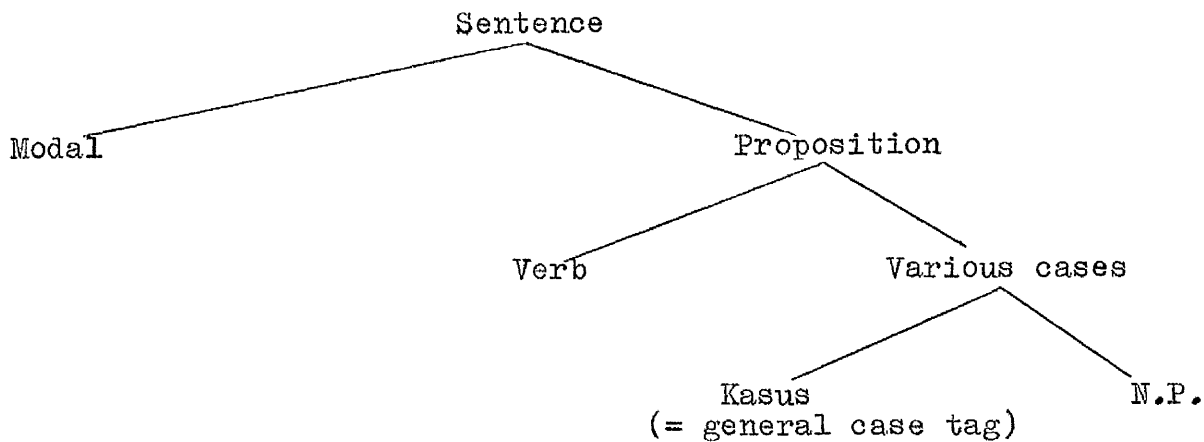
- Appendix A: A hypothetical language-producing system  
(L.P.S.) and the quantitative comparison  
of contrasting L.P.S.'s.
- Appendix B: The assessment of hearing loss.
- Appendix C: Unpublished papers:-
- (1) Ivimey, G. P. and Lachterman, D. R.:  
The written language of young English  
deaf children.
  - (2) Ivimey, G. P.:  
Be and have in the syntax of English  
deaf children.

APPENDIX A

A hypothetical language-producing system (L.P.S.) and the  
quantitative comparison of contrasting L.P.S.'s.

One may hypothesize that between the complexly interrelated intellectual structures studied by semanticists and cognitive psychologists and the possibly simpler but still complex syntactic structures detectable in language behaviour there lies a language producing system (L.P.S.). This L.P.S. receives an input from the intellectual or cognitive domain that may, but more probably is not, homologous with the output of L.P.S. Data from dreams and day-dreams and introspection of one's "stream of consciousness" suggest that there is no close structural relationship between the inputs and related outputs of the L.P.S. Thus a major function of the L.P.S. is to take complexly and perhaps globally structured inputs and to convert these into a more limited set of linear arrays of conventional and arbitrary symbols. The ways in which it achieves this, in so far as they are regular and structured will, when described, form the grammar of whatever language the output constitutes.

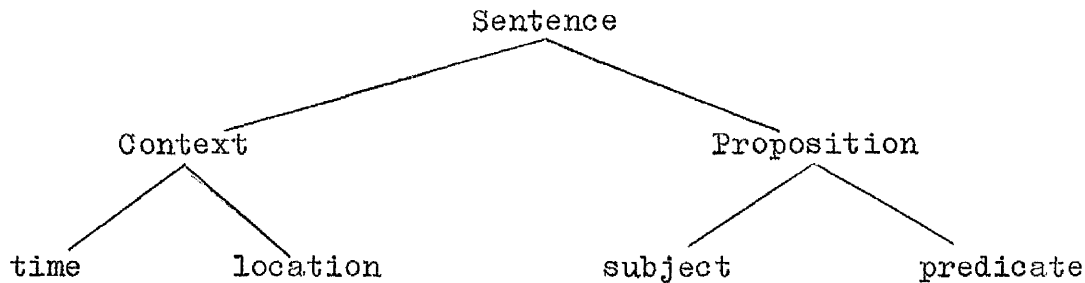
Fillmore (1968) appears to have been describing a possible form of the semantic/cognitive input to the L.P.S. In this case the input is duplex: a proposition and a modal component:-



The cases recognized by Fillmore indicate various relationships, viz. agent, experience, instrument, object, source, goal, place and time (Fillmore, 1971). This model, it is argued, not only makes the task of achieving a semantic interpretation of deep-structure much easier, but indicates, in a clear fashion, relationships between different but related sentences which in T.G. analyses would require different deep-structures. However, one major short-coming of Fillmore's model is the lack of detailed description of the modal component involving negation, mood, aspect and so on, as contrasted with time which appears on each occasion as a standard element. These missing components seem to be taken very much for granted.

Fillmore's model has been used but modified in a number of interesting ways by researchers into the computer simulation of cognition, notably Quillian (1968), Woods, (1970) and Schank (1971). Anderson and Bower however, offer cogent theoretical and practical reasons for rejecting these case-grammar modifications. In their place they offer a human associative memory model, or HAM (Anderson and Bower,

1974). In HAM the basic input to a L.P.S. is a duplex string visualised as exhibiting the following structure:-

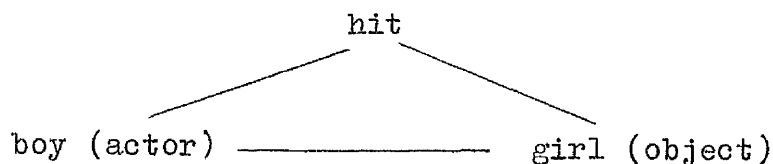


This model seems very close, in principle, to that used by Ivimey and his students. Here the input to the L.P.S. is also seen as duplex, but in rather a different manner.

In Ivimey's model one element is essentially propositional, and would include all or most of the input of Anderson and Bower as shown above. This propositional element will contain constellations of perceptually or conceptually related semantic elements. Thus one propositional input may consist of the following elements, although not necessarily in the linear order shown:-

// boy (actor) : hit : girl (object) //

In order to avoid implications of linearity it may be more appropriate to use a three or n-dimensional model:-



Each of the elements may be further specified, although once more the specification may not be linear:-

```
// boy (actor): determinate : = 1 : + attribute = naughty //  
// girl (Object): indeterminate : > 1 :  
    + attribute = smaller than actor //  
// hit : repeated action, including present time with no  
    clear initiation or termination //.
```

The items underlined represent semantic complexes (susceptible of further analysis but probably entering most everyday communicative acts as units) that will eventually become actual "words" - naughty boy, little girls, hits. They might equally become actual "words" in French, Russian, Chinese, Hausa or any other language whose culture includes naughty boys hitting little girls.

The second input-element to L.P.S. specifies the form of utterance that must be generated to carry the semantic or propositional input-declarative, negative, passive, interrogative, etc. This formal input-element, in contrast with the prepositional, is language-specific.

Within any language the number of L.P.S. states available to any speaker is rather restricted. This may appear to run counter to the widespread view that linguistic structures are potentially infinite, having no determinable upper limit as to length. Such a view is trivial and may be easily destroyed:-



If the structure xyz may become, for example, xyzyz, xyzyzyz or xyzyz....yz, then there is no need to argue that the structure is infinite. It may be specified quite simply by two finite rules:-

1.  $S = x y z$
2.  $yz = (yz)^n_1$

In this case, the second, metastate rule, is as much an element of linguistic structure as is rule one, the base rule. Such repetition metastate rules are characteristic of much, possibly most human behaviours. Walking 100 paces does not involve a different rule than walking 10 paces, or probably than walking 2 paces, it merely includes the element Repeat. Similarly it is unnecessary to postulate a potentially infinite length to the exposition section of a classical Sonata first movement. In intention, if not in actuality, the traditional repetition is identical to the first performance. There is no compelling reason why linguistic embeddings and relativisations should be seen as in any way different. Access to such metastate rules as produce relativized clauses, long sequences of conjoined sentences and so on may be an important indicator of the stage of linguistic development reached.

In contrast to the limited number of formal rules available, the number of possible semantic/cognitive propositional permutations is very large, possibly infinite.

The conceptual distinction between propositional and formal inputs appears to be well-founded. It is the form of

Colorless green ideas sleep furiously

that enables us to recognise it as a possible English sentence, even though the proposition it carries is not interpretable, in the same way that:-

Gloopy malchiks goolyat razdrazily

also has recognisable English form although utilising elements taken from Russian. Although English words are used in the following sentence and a meaning might be with only a little difficulty recovered, no English speaker would fail to recognise it instantly as non-English:-

Although the children the always to be remembered  
in later life holiday enjoyed, never again would  
they visit their grandparents

In addition to what may be called mesostate specifications (related to mesostructures: negatives, interrogatives, etc.) it is possible that part of the input to the L.P.S. concerns microstate specifications, relating to time, aspect, modal and number reference. Some of these may, however, be included

in the propositional input. Macrostate specifications related to extended textual forms may also be hypothesized. These will involve important questions of style, sequence of individual units of discourse, etc. Very little has been achieved in this area so far, but one important macrostate element would appear to be the achievement of conceptual unity through differential uses of determiners, pronouns and tense forms. It will be recalled that the Heiders report the deaf as doing very poorly in this:-

The whole picture indicates a simpler style, involving relatively rigid, unrelated units which follow each other with little overlapping of structure and meaning.

(Heider and Heider, op. cit.,  
p.99)

This assertion is examined in some detail in Chapter 8 and it is there argued that such a description arises out of the application of English macrostate expectations to what seems to be a language with its own macrostate expectations. It would be unacceptable to criticise the French:-

Quand il arrivera vous m'appelerez

because it contains a non-English sequence of tenses. So too, it may be equally unacceptable to apply English macrostate rules to Deafish.

This model, conceiving of inputs to L.P.S. as duplex, one component carrying propositional elements, the other specifying the form or state that the L.P.S. must assume in order

to encode the proposition, has guided, albeit implicitly, the research of Ivimey and his students in London. The elicitation method was designed to investigate systematically and rigorously the number, nature and possible combinations of states assumable by Deafish L.P.S.'s, while holding the propositional elements relatively stable.

The model enables us to see how, in principle, one might arrive at a quantification of differential development of language structures that is both linguistically and statistically meaningful. The essential point in this is that differences in language competence between two informants may be represented by:-

- (1) differences in the number and combinations of the states that may be assumed by the L.P.S.'s.
- (2) differences in lexical (representing rather crudely the propositional) knowledge.

Let it be assumed that each separate element of the formal input to the L.P.S. be represented by  $F_i$ . Then the total, potential formal input becomes:-

$$\sum_{i=1}^m F_i$$

where  $m$  is a small and determinate number. Let it also be assumed that each element of the propositional (lexical) input be represented by  $\phi_j$ , and the total, potential propositional input becomes:-

$$\sum_{j=1}^n \phi_j$$

In this case,  $n$  may be very large and the potential set of combinations may approach infinity as a limit. In practice, with children, especially young and handicapped children may be small and the number of combinations may be severely restricted by psychological and other constraints.

The total, potential input to the L.P.S. may be represented:-

$$\sum_{i=1}^m \sum_{j=1}^n F_i \phi_j$$

Differences between any two language users will be represented by differences between their respective total potential inputs to the L.P.S.:-

$$\sum_{i=1}^m \sum_{j=1}^n \{ (F_i \phi_j)_I - (F_i \phi_j)_{II} \}$$

In the elicitation method as used in this investigation, the propositional input was held constant and differences between two children reduce to:-

$$\sum_{i=1}^m \{ (F_i)_I - (F_i)_{II} \}$$

Examination of the network analysis given in Chapter 8, shows that children in Stage 1 as there defined, have at their access a rather limited number of L.P.S. states:-

$$\left. \begin{array}{l} \text{SV} \\ \text{SVO} \\ \text{SVOi0} \\ \text{SVi00} \end{array} \right\} \text{ where } V = \underline{\text{unit verb}}$$

To these may be added (rarely) locational or directional phrases and each of the resultant 12 forms may become either negative or interrogative, but not both. Thus in their performative sentences, these children have available roughly 36 L.P.S. states.

The children who have developed Future marking will have 96 L.P.S. states and those who also mark regularly and accurately numbers in nouns will have 192 L.P.S. states.

When we come to children in Stage 2 with a threefold time-marking system in verbs, number-marking in nouns and the possibility of adjectival modifications, we find that they have, available for the communication of their ideas, wants and the rest well over 300 different L.P.S. states. It is at this stage that extended-sentence metastate-rules begin to be used with some frequency, further extending the repertoire of L.P.S. states available.

The hearing children tested by Lachterman (op. cit.), are able to vary time-reference, distinguish between several aspects and combine negatives and interrogatives. In their case the number of available L.P.S. states probably exceeds 1,000. Extended sentence metastate possibilities in this group are numerous, giving the children L.P.S. state repertoires well in the thousands.

We see therefore that the results of analysis of a controlled elicitation sample of language are, in principle,

quite accurately quantifiable. As a result the method is not less susceptible of numerical and statistically manipulable accuracy. However, little would seem to be gained from such accuracy<sup>x</sup> especially since such a conclusion may import the dangers of assuming only a quantitative, as opposed, as we shall see, to a possible qualitative, difference between two groups or individuals. It is probably linguistically more meaningful and also statistically adequate to describe in linguistic terms, stages of development and allocate children to these impressionistically, even if this entails some imprecisions.

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x Although the 60 or 70-fold difference in L.P.S. complexity between 13 year-old deaf children in Stage 1 and hearing children aged 10 is striking and presents a comprehensible and clear fact.

APPENDIX B

5

The assessment of hearing loss

Assessment of hearing loss depends on the application to auditory perception of a rather primitive psychophysical technique: the method of limits (Woodworth and Schlossberg, 1955). Although much ingenuity has been expended in improving the use of complicated electronic equipment to the problem the basic procedure remains the same. A subject is presented with a series of stimuli of different frequencies, usually multiples of 250Hz.<sup>x</sup> Each of these is varied systematically and usually in discrete steps of intensity. At each presentation the subject must indicate in some appropriate manner whether he believes the stimulus to be present. In the case where the stimulus is present but a response is absent it is assumed that the intensity has fallen below the subject's perceptual threshold for the frequency concerned.

As most commonly used, the stimulus consists of an electronically generated pure tone (i.e. one generating a smooth sine wave in a cathode-ray tube). The stimuli are presented to each ear separately, with or without a masking

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x Hz. represents the number of compressions and rarefactions of air molecules generated per second. The former unit was c.p.s. or cycles per second.



tone of "white sound" presented simultaneously in the contralateral ear. This masking sound is used to prevent the tested ear from "picking up" either air-borne sound carried round the head and into the meatus of the contralateral ear, or shock-waves transmitted through the bones of the skull to the inner-ear mechanism of the contralateral ear.

At whichever frequency is being tested the stimulus is presented initially at a level well above the subject's auditory threshold. In a normal, healthy young adult this threshold is taken conventionally at a sound pressure level of  $.0002 \text{ dyne/cm}^2$ , but with a deaf subject it may be considerably higher. In this case the level of initial presentation will depend on the assessment of the audiometrician. After the first presentation the intensity level is reduced in 10 decibel (dB) steps. At the point where the subject ceases responding it is raised in 5dB steps until a response is received. This point is frequently, but incorrectly<sup>x</sup>, taken to represent the subject's auditory threshold at that frequency.

The process is repeated at each frequency being tested (usually 125, 250, 500, 1,000, 2,000 and 4,000 Hz) for both ears, and the results are plotted on a log.-log. graph called an audiogram.

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x It is incorrect because, in the method of limits, the mean point between last "no response" and first new response is taken as one indication of threshold. Actual thresholds are calculated from a large number of such indications. It is probable that most audiograms indicate thresholds incorrectly by as much as 5 or even 10 dB.

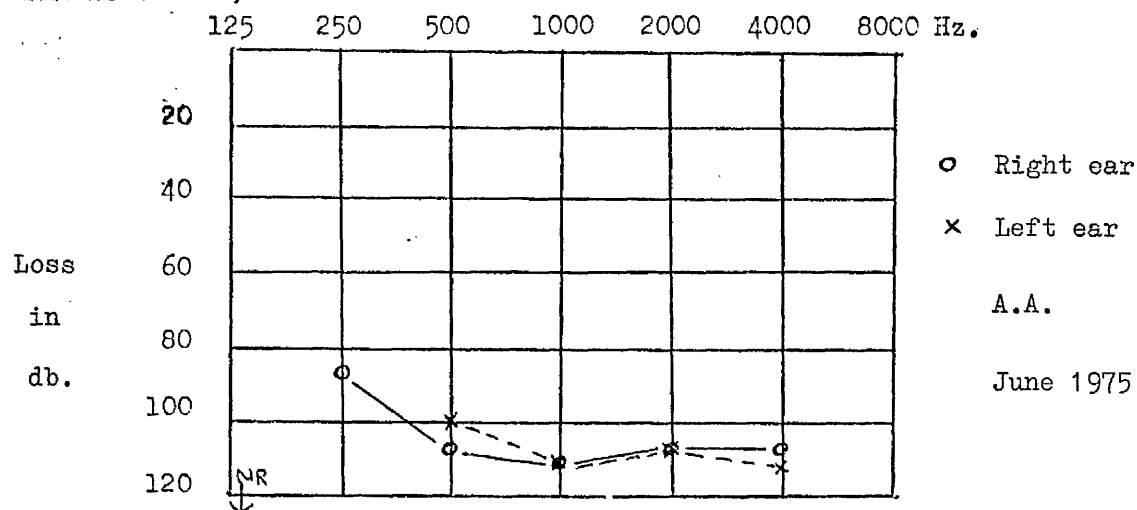
For ease of reference the four frequencies conventionally held to be most important in audition for speech (250, 500, 1,000, 2,000 Hz.) are averaged.

For young children sounds more naturalistic than pure tones (i.e. bells, pitch-pipes, a spoon striking the side of a cup, paper being rustled, etc.) are used. In addition, pure tones may be generated at some distance from the child who is allowed to play (Free-field Audiometry). In both these cases, a response to sound is taken to be some evidence of distraction from the play such as a glance in the direction of the sound.

These techniques present some difficulties involving the accuracy of measurements of sound levels at the ear of a restless and moving child, the prevention of utilisation of visual cues, the assumption that level of attention is constant at all times, etc. In spite of these disabilities the techniques are felt to provide a less artificial testing situation than that of pure tone audiometry, involving the wearing of clumsy and perhaps frightening ear-phones and sitting still for periods as long as half-an-hour.

With older children some attempt may also be made at estimating the hearing for lists of phonetically-balanced words (Dale, 1967). These words are presented in random order at successively lower intensities until a perceptual threshold is reached. However, this method tends to be confined to the

larger clinics. For most deaf children the data available in their schools consists of pure-tone audiograms like the one shown below, taken from one of the children studied:-



There are a number of difficulties and problems associated with the procedures outlined above. Some of these are methodological and result in the possible wrong assessment of auditory perceptual thresholds. In one sense this is not serious for purposes of comparison between groups. If similar errors occur in the case of both then these errors may be discounted:-

- (i) One of the errors - that of wrong computation of thresholds has already been mentioned.
- ii) Another is the basic assumption that no response indicates no perception is probably simplistic. Little attention has been paid to the significance of false-positive responses (i.e. response in the absence of stimulus) and it is rare for any record of such errors to be made. This results in measure-

ment of an "absolute" threshold when a probabilistic one may be more appropriate.

(iii) Perception at or near threshold of even normally hearing subjects is not always easy to understand. Abundant research has been carried out of the perception of faint stimuli that are also very fleeting in military circles and at the Bell Telephone and other laboratories (a brief bibliography is given in Ivimey (1977(a)) but this is almost totally ignored by professional audiometricians.

(iv) Evidence exists (Small, in Jerger, 1963 ) that the auditory mechanism habituates to faint stimuli just as one's eyes habituate to the faint stimuli in a darkened cinema. The period of habituation extends in the case of audition to periods usually in excess of the time devoted to testing. Thus it is possible that every subject is tested while he is still acoustically "dazzled".

In general the best that can be said of most audiometric tests is that they give some estimate of what sorts of stimuli a subject has not responded to, but give no evidence of the stimuli (both sorts and levels) that he might respond to under other circumstances. For practical purposes, at the present stage of development of audiometry, since these disabilities probably influence the majority of tests they can probably be ignored when making comparison between children

or groups of children.

However, another set of disabilities cannot be so ignored. The research described in this thesis extends over nearly 40 years, extending into the period before the availability of cheap and powerful electronic amplifiers. As a result, very different standards of hearing ability have been used. Thus the term "profound" deafness may, in different publications, refer to very different thresholds. As recently as 25 years ago the following rule-of-thumb categorisation was widely used and was taught to the author in his training:-

<u>Hearing loss</u>	<u>Categorisation</u>
40-60 dB	partially hearing
60-70 dB	severe deafness
70 dB	profound deafness

Under this system children with hearing losses of 90 dB would be categorised, at best, as sub-totally deaf, and in many cases as totally deaf. It is significant that many audiometers still in use do not measure losses of greater than 100 dB. The assumption here is, presumably, that such a loss is virtually total.

In contrast many children now provided with powerful hearing aids and appropriate auditory experience from early infancy may function quasi-normally even though these audiograms may indicate hearing losses of 90 dB or more. For the

majority of hearing-handicapped children in Britain attending schools and Partially Hearing Units a more appropriate categorisation would appear to be:-

<u>Hearing loss</u>	<u>Categorisation</u>
60-70 dB	partially hearing
70-90 dB	severe deafness
90 dB <sup>x</sup>	profound deafness

Hearing losses of up to 120 dB in some cases appear to be regarded as still valuable.

These differences have several significances. A simple categorisation may not be very meaningful. Today's partially hearing child may be yesterday's profoundly deaf child. Unfortunately the difference is not merely one of historical importance. As recently as 1972 one writer reminded the author that he was referring to "profoundly deaf children" with losses of 70 dB (Denmark, 1973). In terms of the research literature, these figures indicate the desirability of some caution: the Heiders' subjects (1940) would be classified as partially-hearing in contemporary Britain and would probably receive rather different educational and linguistic experiences as compared with the profoundly deaf.

A second major disability is that many of the audio-

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x Bamford and Bench (op. cit.) include children with hearing losses of 90 dB in their partially-hearing sample.

metric records on which researchers must rely are of varying quality. Many audiograms are compiled by teachers whose training in audiometry is of the most elementary. Rooms in which testing is carried out are not always adequately sound-proofed and this causes contamination of measured sound levels by ambient sound. Further it seems not always to be realised that movement of an audiometer may seriously impair its calibration. In many cases audiometers are not re-calibrated annually. A further disadvantage of school-based audiometric testing is that changes in staff may involve changes in audiometricians, adding yet further uncertainty to the problem of assessing hearing-loss.

To the non-expert these differences, probably in the nature of only 5 or 10 dB. may seem trivial. This is far from the case: since the decibel scale is logarithmic (to base 10) a difference of 2.4 dB. will represent a perceptual difference of approximately a doubling. Thus a child with an "average" loss of 87 dB. will be only "half as deaf" as one with a loss of 90 dB. Given the measurement uncertainties and errors discussed above, the difference may, in reality, be much greater, much less or the same! In the children studied, assuming that measurements are accurate, RS (av. loss 110 dB.) is some 4 times deafer than his cousin SS (105 dB.) and several thousand times deafer than the subject with the most hearing (SW, 78 dB.)

Unfortunately the behavioural and educational significance of differences of this degree have not been systematically explored.

One final problem in interpreting the literature on deafness in children lies in the use by American workers of different standards as compared with the Europeans (Newby, 1972). Until 1964 the basal threshold for normal audition accepted by the American Statistical Association was used. This tended to underestimate the degree of deafness in any individual by between 10 and 15 dB. on the average. The actual discrepancy varied from 15 dB. at 250 Hz. to 6 dB. at 2,000 Hz. The International Standards Organisation was adopted in America from January 1st, 1965. Not every report indicates which of the two standards is being used.

We see therefore that very little precision can be expected in the literature on auditory disability. In any specific example it is difficult to be sure just what is intended either by verbal categorisation or even by use of actual figures.



APPENDIX C

Unpublished papers

- (1) Ivimey, G. P. and Lachterman, D. R.: The written language of young English deaf children.

A b s t r a c t

Utilising a method used earlier with a single child (Ivimey, 1976) the written syntax of a group of young English deaf children is analysed and described. In contrast with the findings of several earlier workers it is shown that these children have constructed a systematic set of syntactic rules that they use regularly and creatively to produce novel utterances. These rules may, tentatively, be divided into base and transformational components. Although probably based on experience of normal English, these rules are not those of normal English as used by hearing children of similar ages. Although each child demonstrates idiosyncratic features in his syntax there are broad similarities of syntax between children, to the extent that there appears to have developed a special language or dialect with its own structure. Doubts are cast on much previous research into the language achievements of deaf children that has tended to utilise standardised and other tests based on normal English.

Many workers have studied the language skills of deaf children and have published useful descriptions. As compared with hearing children of similar ages and ability, deaf children tend to use shorter and simpler sentences (Heider and Heider, 1940; Simmons, 1962). These sentences are often defective, being characterised by many "deafisms" (Myklebust, 1960), i.e. the use of carrier-phrases of stereotyped and repetitive form, of omissions, additions and substitutions. Brannon (1968) reports an under-use of function words, especially of connectives and auxiliaries, with an over-reliance of content words. Presnell supports this: "The syntactic constructions deviating most from the normal order of ..... usage were the verb constructions" (1973, p.20).

These descriptions have some value, but this is limited because they do not tell us whether the errors described are random, which would suggest that the language productions of individual children should be rather unlike, and that deaf children have only limited potential for language acquisition. This has been asserted by many writers. Blanton and his co-workers at Vanderbilt University state that the deaf "lack syntactic organisation" (Blanton et al., 1971, p.102), while Fusfeld goes further: the writing of the deaf is a tangled web type of expression in which words occur in profusion but do not align themselves in an orderly way" (1955, p. 68). Blanton suggests that "the organisational aspects of English, whatever the medium (i.e. of communication

and instruction - G.P.I.) may be almost impossible to learn without being able to hear" (op.cit., p. 82). Much of the experimental work of Furth is predicated on the assumed lack of verbal language of deaf children (Furth, 1966 and many others). If, in contrast, the language produced by the deaf can be shown to be rule-based and systematic, then this would be strong evidence for the ability of the deaf to form linguistic concepts, although these concepts may not be congruent with those of the social groups in which the deaf children grow up.

The view that the deaf are alinguistic derives from the assumptions of the researchers. They have generally assumed that deaf children in North America and Britain are using English sentences, albeit with many errors. As a result the research methodology has consisted of a fairly primitive process of counting errors, or of comparing mean lengths of utterance, type-token ratios, etc. (Simmons, 1962) of sentences produced by the deaf and other comparable groups. A rather different approach has been developed over the last five years at the University of London Institute of Education (Barclay, 1975; Ivimey, 1976a; Lachterman, 1974). This approach has been founded upon two assumptions:-

- (1) We may not assume, ab initio, that a deaf child is speaking or writing English, or indeed any language known to man. The organisation (i.e. syntax) of sentences, if any, is the unknown

that must be discovered.

(2) We may assume that if a language user spontaneously produces utterances that are characterised by regularly recurring features then these features are the exponent of a set of organised linguistic rules.

By analysing the sentences produced by a profoundly deaf 10½ year old girl, Ivimey (op. cit.) was able to show that her language production was not a random concatenation of words but reflected the operation of a set of rules. These rules have some affinities with those of normal English but are sufficiently deviant to be regarded as a language system sui generis. The major characteristics of this system are:-

- i. The verbal system is characterised by use of an unchanging unit verb, with time reference indicated by an external marker:-

The boy climbed up a tree now

Tomorrow the boy climbed up a tree

The boy climbed up a tree (past reference indicated)

The form of a verb may be "past" or "present", but this has no time-signalling significance. Any single verb tends, as in the example above to preserve its form through all changes of time and aspect reference. Any changes that do occur are not systematic and appear to be random errors.

ii. Noun phrases are simple and number marking is absent or faulty. Very little use is made of modifications to nouns, either adjectivally or through determiners. There appears to be a difference in syntactic status between NP's in subject and object positions, in that determiners tend to be absent in object, but present in subject positions.

iii. With the exception of a restricted range of "concrete", locational and directional forms (e.g. in the water, to school, under the table) the grammar is characterised by absence of prepositions. Thus the child wrote:-

Daddy gave presents boy

Daddy was very cross boy (for: with the boy)

The two girls kick knee and bottom boy

iv. Under the operations of negation and interrogation the sentences function as units to which are added specific negating and interrogative markers.

Ivimey's work shows that all the features described by earlier workers can be found in the language of his subject. In addition it shows that these features are systematic; at least one deaf child has developed an organised and ordered set of language rules. However, two problems remain: whether other deaf children can also develop language rules and whether these

rules are idiosyncratic or mutually congruent, i.e. whether there is any evidence for the existence of a specific dialect or language of deaf children.

### Method

#### Subjects

The data were collected by the authors working in collaboration, and were used by the junior author in a dissertation in partial fulfilment of course requirements for the degree of M.A. at the University of London Institute of Education (Lachterman, op. cit.). The experimental group of eleven severely deaf children were drawn from two London primary schools for the deaf. Mean hearing loss in the better ear was 89 dB. and all children were deaf from birth. At the time of the investigation they were aged between ten and eleven years and all had been in a school for the deaf for at least five years. They included six boys and five girls. Five of the children were of foreign parentage. One boy had deaf parents and used manual methods of communication at home, while the others used a mixture of oral/aural communication and natural gesture, supplemented by some rather crude attempts at using conventional deaf manual signs. The latter were used especially by the children when communicating with each other. In one of the schools (involving five children) Cued Speech was used as the medium of instruction. The mean I.Q. of the group was in the region of 90, i.e. below that of the population as a whole, but within the normal range.

The test instrument was used with a control group of four hearing boys aged 11 yrs. - 11 yrs. 9 mths., taken from a primary school in South London. They were of average ability and came from a similar socio-economic background as the experimental group.

### Procedure

Written language samples were elicited from each child individually in response to a series of brightly coloured pictures that called for the use of only simple vocabulary (Ivimey, op. cit.). Each child was asked to write a sentence about the first picture. Then he was asked its time reference, i.e. Is that now or tomorrow or yesterday? Thereafter the child was asked to produce a negative (Write "not"), an interrogative (Ask a question) and to vary the time reference (Write tomorrow, yesterday, everyday)<sup>1</sup>. These were also combined, giving future and past negatives and interrogatives. In addition, use of double object sentences, transitive and intransitive verbs, prepositions and be and have were studied.

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1 These words were used in place of present, future, past, negative, etc. since they are used by the teachers in lessons and are understood by the children. A pre-test session was used to habituate the children to the test situation and to discover whether they understood the instructions. Instructions were given in written form and using conventional gestures.

Table 1

Size of Corpus of Data Elicited from Eleven Children

	Number of Sentences					
	Decl.	Neg.	Interrog.	Double object	Intrans.	Prep. Phrases
<u>Present progressive</u>	69	40	58	34	35	45
<u>Present habitual</u>	32	33				
<u>Future</u>	57	35	24			
<u>Past</u>	68	34	21			
	226	142	103			

In all 873 sentences were elicited, but only 585 will be analysed in this paper.<sup>2</sup> Those sentences containing be and have will form the subject of a later paper.

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2 Full protocols of data are omitted for reasons of space. Copies may be obtained from the senior author.



## Results

### Treatment of data

Each sentence was accepted as it was written: no additions or deletions were made, nor was any attempt made to categorise sentences as "right" or "wrong", since this can be done only in terms of a known system, and it is the system that is being investigated. Treatment consisted of the detection, analysis and description of systematic patterns of production. Many patterns included "errors" in normal English terms, and in place of the more common error-enumeration technique, this method may reasonably be called an error-analysis approach (Richards, 1974). Productions were analysed for each child separately in order to detect intra-individual or idiolectal systems. Subsequently these analyses were compared in order to test for inter-individual or group regularities. If these can be shown to occur this would be strong evidence for the existence of a specific juvenile deaf dialect or language. In fact there is considerable congruence between individual rule systems, as can be seen in Table 2.

Table 2

### Similarities in production of unit verb structures

% of sentences exhibiting rules described by Ivimey (op. cit.)

N	declaratives	negatives	interrogatives
11 children	66	81	93
8 children	81	83	97

When noun phrases are examined we find a similar picture

emerging (Table 3.).

Table 3

Treatment of Noun Phrase Features

Feature	Correct marking for no.	Nos. of children (N = 11)		Single deter- miner in NP <sub>0</sub>	Adjective present
		Concord (a) with <u>be</u>	(b) with other verbs		
Present	6	4	0	10	4
Uncertain	3	1	0	0	0
Absent	2	6	11	1	7

Table 3 shows that most of the children make use of rather similar syntactical devices in handling nominals, viz. the general lack of adjectives, presence of a single determiner in multiple noun sequences and absence of subject-verb concord. In contrast with Ivimey's original subject, the group as a whole has moved some way towards a correct marking of number in nouns, although there are still uncertainties in this.

Analysis

Inspection reveals no clear distinctions in the syntactic productions either between schools or between sexes. Therefore, the results are pooled for the purposes of this analysis.

(1) Verbal systems: declaratives

Table 2 shows a fair measure of agreement among the children in the form of the standard declarative sentence

produced. Eight of the eleven children exhibited consistently the features of unit verb and external marker described earlier by Ivimey. The remaining children appear to be moving towards a more advanced system, but it can be shown that they have not long left behind the simpler patterns used by the majority: application of transformations causes them to fall back on the simpler structures, presumably as a result of the additional cognitive strain imposed by the use of the transformation.

The rules underlying the simple sentences used by the majority have been described earlier by Ivimey (op. cit.) and here it will be sufficient to give only a few examples. One child wrote:)

He punch the little boy

Everyday the two girl's punch the small boy

Tomorrow the big boy punch the small boy

Before the two girl's punch the small boy

It is probable that the actual time marker used is an artefact of the test since the children repeated the words used to elicit the different time reference. In wholly spontaneous productions time markers are frequently omitted.

A first approximation to the structure of the verbals of these children is:-

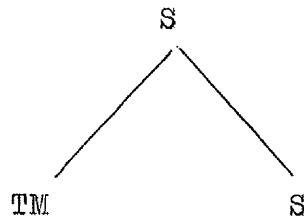
S  $\longrightarrow$  X + unit verb + Y

Thereafter, time reference is achieved by treating S as a

unit and pre- or post-fixing an appropriate time-marker:-

$$T_{\text{time}} : S \rightarrow \left\{ \begin{array}{l} \text{TM} + S \\ S + \text{TM} \end{array} \right\}$$

This rule merely captures the surface features of the transformation. A possible deep-structure may be:-



with two optional transformations:-

$$\begin{array}{ll}
 \text{T 1 (Time-marker Shift)} & T_{\text{tm shift}}^{\text{opt}} : \text{TM} + S \Rightarrow S + \text{TM} \\
 \text{T 2 (Time-marker deletion)} & T_{\text{tm del.}}^{\text{opt}} : \text{TM} + S \Rightarrow \emptyset + S
 \end{array}$$

The exponent of a unit verb may appear in the form of a normal English present tense:-

The man punch the boy

Tomorrow the man punch the boy

Before the man punch the boy

or of a past tense:-

The two children looked the television (with present  
reference)  
Tomorrow Mary and John looked the television  
Yesterday Mary and John looked the television

All of these forms were produced by one child. As can be seen, each verb tends to preserve its form through all changes of time reference, but this form has no semantic signalling function as it would have in normal English. This point is more fully illustrated in Table 4.

Table 4

Relation between form of verb and time reference

Form of verb	% Time reference		
	Present	Future	Past
Present	35	11.5	18
Future	0	5	0
Past	26	8	8

From Table 4 we can see that:-

- (1) A verb in normal English present form is as likely to refer to non-present time as to present.
- (2) A verb in past form is three times more likely to have present reference than past.
- (3) Past time is indicated by a verb with present form twice as often as one in past form.

(4) Future form with its clearly marked signal will, is confined to future time reference, but futurity is more likely to be indicated by a verb in present or past form. These data indicate that for the majority of this group little reliance can be placed on the formal appearance of any verb with respect to semantic time reference.

In contrast with this, three of the children appear to have moved towards the development of a system of marking time reference within the VP itself: an internal as opposed to an external-marking system. They still retain some features of the more primitive system, however.

(a) RW uses a consistent internal marker to indicate futurity:

Tomorrow two big girls will kick to him

but will may be prefixed to a unit verb as well:

Tomorrow Ruth and Mark will watched the television

Watched is used in other sentences with different time reference and appears to have the status of a true unit verb.

(b) SW also uses will to signal futurity:

Tomorrow the man will punch the boy

and this appears to be much more solidly based as an internal marker, since he also regularly distinguishes between the present:-

The two girls is kick near the boy

and past:-

Yesterday the two girls kicked near the boy

However, in this case, it is the "past" which appears to be transitional, since the marker -ed is affixed to a unit verb in present form:-

The man is punch on his hair becomes Yesterday the man is punched the boy

The boy is climb on the tree " Yesterday the boy is climbed on the tree

(c) DA, the only child in the group with deaf parents, is also in this rather more advanced stage, but his productions are still very confused. He uses several different forms to indicate futurity:-

The two girls will be kick to the small boy again

John will be climbing the tree

The big boy ready to slap to the small boy

In the past he uses two correct forms: walked and saw, but seems to prefer a form with been: the small boy

The two girls been kick to the small boy

John been climbed the tree

Clearly this small group of children have begun to develop a differential system of internal marking for time. This can be easily seen in Table 5.

Table 5

Relation between form of verb and time reference at Stage 2

(No. of cases (percentages in brackets))

Form of  
verb

Present cont.    Present habit.    Future    Past

"Present"

V-ing	1	1	
V	<span style="border: 1px solid black; padding: 2px;">4</span> (64)	1	1
is V	<span style="border: 1px solid black; padding: 2px;">9</span>	3	
is V-ing	1	<span style="border: 1px solid black; padding: 2px;">4</span> (80) <span style="border: 1px solid black; padding: 2px;">4</span>	1
is V-ed	1	1	

"Future"

<u>will</u> (go) V (ing)	<span style="border: 1px solid black; padding: 2px;">14</span> (100)
<u>ready</u> to V	2

"Past"

V + vowel change	7	
<u>(is)</u> V-ed	5	3 <span style="border: 1px solid black; padding: 2px;">11</span> (55)
<u>been</u> V (-ed)		5



Table 5 shows that there is still a great amount of confusion: a verb ending in -ed has a 25% probability of being used to indicate present time, while seven out of eight strong verbs (i.e. those with vowel changes) are linked with the present. However, some regularities are appearing, to the point where it becomes realistic to talk about the morphology of the verbal system:

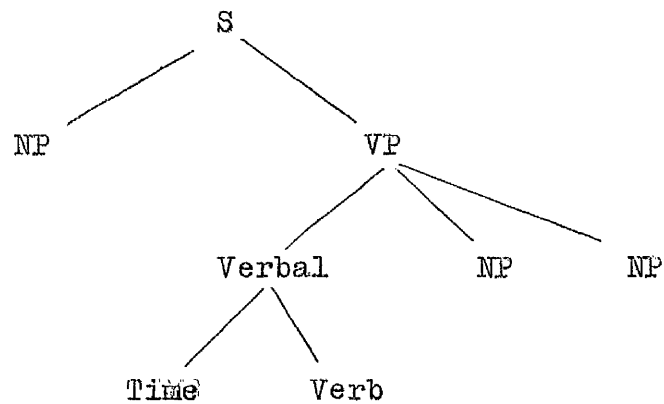
- (1) A simple verb (V) or the form is V have a 65% probability of being linked with present continuous time.
- (2) Is V + ing tends to be confined to present habitual and future time.
- (3) Will universally indicates futurity. It often occurs with other forms, so that a complete specification is: will (go) V (ing).
- (4) V + ed has a 55% probability of indicating pastness.

From this we can see that this group has isolated the following time markers:-

<u>is</u>	indicates present continuity,
<u>-ing</u>	" present habitual or (near?) future time,
<u>will</u>	" future time,
<u>-ed</u>	" past time.

Although this small group of children still exhibit considerable confusion in their handling of verbal structures, it is possible to recognise an emerging internal structure. A first approximation in formally describing this is:-

Figure 2.



Where: Time = is +  $\phi$  : Present Continuous,  
 (is) + -ing : Present Habitual or near Future,  
will +  $\phi$  : Future,  
 $\phi$  + -ed : Past.

This reduces to:

Time = be + affix (be = is, are, will, 0, as above)

<sup>ob</sup>  
<sup>T</sup> affix shift : be - affix + verb  $\Rightarrow$   
be + verb - affix

Other morphological changes seem to be either random errors or the vestiges of a more primitive unit verb system.

### Negatives

All the children used similar transformations to produce negative sentences. Over 90% of negatives have been formed in a manner similar to Ivimey's original subject:-

Where : S = X + unit verb + Y

T<sub>neg</sub> = NEG + S  $\Rightarrow$  X + neg - unit verb + Y.

In 52% of the cases the exponent of neg is not

The little boy not push hair

Tomorrow the little boy not kick

A few examples of not to occur, but this seems to have similar status to not:

He's father not to slap

He not to climb up the tree

Is not appears in 38% of cases, but once again it seems to have the same status as the formally simpler not:

Everyday the two girls kick the boy becomes Everyday the two girls is not kick the boy

Tomorrow the man punch the boy becomes Tomorrow the man is not punch the boy

In a few instances did not is used:

He did not punch the little boy (with present references)

Everyday he did not climb up the tree

Two children use did not consistently, while a third uses it only with have and climb:-

The boy climbed up the tree becomes No the boy did not climbed up the tree

At first sight this may appear to be the emergence of a "dummy do" form, but the examples given above show that this is not so: did does not signal pastness, while another example produced by the child above:-

No I have did not the pencil

reveals that did not is little more than a grander variant (or pseudo-"Dummy do") of the simpler not.

These uses of is not and did not must force us to be cautious in interpreting the production of negatives by the more advanced group of children. It may be that they are using a transformation to embed NEG in the middle of the verbal, possibly after the operation of the affix shift transformation:

Where : Verbal = X + time + verb + Y  
           = X + be - affix + verb + Y

$T_{\text{aff.sh.}} \Rightarrow X + \text{be} + \text{verb} - \text{affix} + Y$

$T_{\text{neg}} : \text{NEG} + S \Rightarrow$

X + be - neg + verb - affix + Y

neg = not, n't, did not.

Thus we find the following pairs:

<u>declarative</u>	<u>negative</u>	
is punch	is not punch	(Pres.cont.)
are kicking	are did not kicking	(Pres.hab.)
will go punch	will go not punch	(Future)
is climbed	did not climbed	(Past)

all produced by the same child. An alternative interpretation would be that, since some other children also use is not with the unit verb, this is little more than a falling back upon a more primitive process.

#### Interrogatives

For most of the children the formation of interrogative sentences is relatively simple. Although there is considerable variation in appearance much the same sets of rules appear to be operating in each case. These rules have been described in Ivimey's original paper and are used by five children. First the time marker is preposed to S, or where it appears at the end of S in declaratives it is moved to the beginning:-

$S \longrightarrow TM + S$

Thereafter an interrogative word (Q) is preposed:-

$T_{int} : TM + S \Rightarrow Q + TM + S$

Q Did TM tomorrow S Ruth and Mark will watched the television

Q Did TM before S the dog run bite the postman

Q Is TM tomorrow S dog bite postman

A sixth child belongs to this group, although his transformation involves moving TM to the end before preposing Q:-

the declarative

TM tomorrow Mary and John looked the television becomes

Q What is Mary and John looked the television TM tomorrow

Other children produce variations upon this theme.

For DA interrogation is indicated by moving is from before the verb to sentence-initial:-

John is trying to climb the tree becomes Is John trying to climb the tree?

This child is one of those with the more advanced strategy for producing declarative sentences, and this sentence appears to be quite advanced. That it is still very primitive is seen in the following examples, where is functions as a mere Q-marker, rather than as a shifted auxiliary:-

Is      John and Mary will be watching the television again

Q      S      TM

Is      the postman been posted the letter

Q      S

Is      Mary gave a bone to her dog

Q      S

For AJ and LE the process is similar, but Q becomes why or why did. Well over 90% of interrogatives produced are formed on this pattern, and as was seen in the case of negation, the addition of extra cognitive load by use of a transformation seems to have led to a regression to simpler models. Of the three more advanced children, two used strategies identical to those of the majority, while one was trying to use more complex sets of rules, but these seem to be either genuine confusions or variations on the basic theme.

#### Transitive and intransitive verbs

An attempt was made to study knowledge and ability to handle differences between transitive and intransitive verbs. Eight out of the eleven children seem to distinguish between these two classes. Two do not, largely because they exhibit a general immaturity in using prepositions. This causes intransitives to appear as transitives:

The big boy fall the big stone

The boy is sleeping the bed

The third child, the oldest, over-uses prepositions, thus obliterating the distinction:-

The man punch on his hair

The boy fell on the stone

These appear to be reasonable forms, but out of a total of 23 declarative transitive sentences, 14 contain prepositions and all but three of these are on.

(2) The nominal systems: Noun phrase structures

An outline of the structures found in nominal phrases can be seen in Table 3:-

(1) There is a general lack of use of modifying adjectives. This is a commonly reported feature of the language of deaf children, but, in fact, the differences in adjective utilisation between the deaf and hearing control groups are not statistically significant and very few of the children used modifiers. In part this was probably due to the form of the test which made few demands for such modification.

(2) There is no contrast between subject and "function" verbs, and only four of the children showed any form of subject-verb agreement with be.

(3) Ivimey's original subject differentiated between noun phrases in subject and object position in that determiners are used in the former but are almost universally absent in the latter. The larger sample supports this, but to a smaller



extent. By and large determiners are used in NP subject position very much in the same way as in normal English. Out of 93 declarative present tense sentences only two noticeably non-English forms appeared: in one case a determiner was used before a proper noun:-

The mummy gave £1 the girl

In the other case the determiner is omitted from before a common noun:-

Before dog bite

These are deviant in terms of the "deaf" system, where determiners are included or omitted in a similar manner to normal English, and may represent random errors.

(4) In sentences with double objects, both permissible normal English patterns are used by this group of children. Thus we find verb + direct object + to + indirect object:-

Mummy gave some money to Mary.

John mummy gave £1 to him.

as well as verb + indirect object + direct object:-

Mummy gave Mary £1.

However use of to with a final indirect object is largely limited to proper names and pronouns. In seven other cases where it might be expected it is omitted:-

John gave a present the baby.

The girls gave a bone dog.

It will be shown later that the children are rather poor in their handling of prepositions and the omission of dative to is probably an aspect of this.

(5) A curious and rather widespread rule is the tendency to use only one determiner, if at all, in a sequence of nouns. This is found in ten out of eleven test protocols:-

The boy is give present the man.

The girl give bone the dog.

(6) Possession is usually shown by mere juxtaposition of elements:-

The dog bite postman leg.

The two girl kick knee and bottom boy.

Two children have progressed beyond this and use apostrophe s, but apparently only in either subject or object position:-

A dog will bite a postman's leg.

The small boy's dad slap his face.

David's father slap David head.

Only one child uses the apostrophe s in both positions.

(7) Ivimey's subject was very uncertain in indicating number in her NP's. In contrast the larger group has advanced somewhat from this point: number is marked correctly (in terms of normal English rules) in most nouns.

### 3 - The nominal systems - Prepositional Phrases

The subject in Ivimey's original paper tended to use concrete, i.e. locative and directional prepositions quite normally, possibly the result of specific teaching of items that are relatively easily demonstrable. For the rest, however, her productions were preposition-free. This may be one of the causes of a very noticeable feature of much of the writing of deaf children: the apparent concatenation of rather loosely related words. The original subject produced utterances like:-

The two girl kick knee and bottom boy

Daddy very cross boy (= very cross with the boy)

None of the other children were in quite this primitive stage, but nearly all exhibited considerable confusion in the shape of the omission of regular English forms and/or over-use of others. In this way each child gave his work a personal touch of mild eccentricity:-

The two girls is kick near the boy

The two children looked the television

He not fell down up the tree

Although each child tends to be fairly consistent in his preferred use of one or other specific forms it was impossible to detect any regularities between children in their use of prepositions, except that some appear to have been learned as parts of a larger verbal unit. Thus fall down, fall over and climb up appear to function as units as do (for several children) kick to and slap to. This would explain the curious use of fall down up above: this is not fall + confusion between down and up, but fall down as a unit with no directional reference + up (i.e. where the action originated).

In locative phrases under and on appear to be used as in English, while near often replaces in front of and behind. Just as the group of children use a syntactic system rather different from that of normal English, this may indicate a different semantic model as well. Near is a superordinate concept, including in front of, beside, behind, etc. as subordinate concepts. Being of greater generality, one might expect its use to be more common, with the more specific concepts developing later. Where children have moved towards greater specificity, in front of is replaced by the simpler form front and behind by back.

To is used frequently in directional phrases (to school) but is frequently omitted in datives and is totally absent in verbal sequences like want to go.

In the group as a whole use of prepositions is very confused, but a few children are reducing the chaos to a more correct system. One child uses a wide range of forms in much the correct English way:-

<u>look up the tree</u>	<u>climb up</u>	<u>fall over</u>
<u>look on the television</u>	<u>play with</u>	

SJ has not quite reached this stage. He uses several "Correct" or nearly correct forms:-

<u>climbed up the tree</u>	<u>fall over the stone</u>	<u>sleep on the bed</u>
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but alongside these omits the preposition in looked the television and walked the school. He rarely uses to, but this lack may be only apparent, since in datives he regularly uses the verb + I.O. + D.O. sequence, in which absence of the preposition goes unnoticed.

In contrast DA has a full and generally correct English set of prepositions, although he does retain the strange slap to and kick to:-

contrast - John and Mary sitting on the floor  
Mary gave a bone to her dog

John is fell over the rock

The baby is sleep in his bed

with - The big boy slap to the small boy

The two girls kick to the small boy

### Complex and compound sentences

One of the limitations of the form of the test used to elicit sentences is that it confines the subjects rather rigidly to the production of simple sentences. It must not be assumed, on the basis of the evidence presented in this paper, that deaf children can produce only simple sentences. However, since many other workers have reported a preference for simple sentences it may be that the form of the test has been less restrictive than it seems.

In fact a rather small percentage of sentences produced spontaneously were compound or complex, although most of these were produced by only two or three children. In these sentences one can detect the emergence of some crude but apparently regular subordinating and conjoining strategies. Since these are not supported by knowledge or use of an adequate battery of syntactic functors the end-product appears to be the commonly reported concatenation of loosely linked words. This appearance may cause an observer to underestimate the linguistic ability of the children.

It is possible to detect a hierarchy of complexity in use of subordinating and conjoining rules. For the most part, complex sentences are formed from concatenation of simpler sentences, either without and:-

David's father slap David head. He said ow.  
He climb up to tree. Why (= because?) he want  
to play. He climb up to tree and fell down.

or with and:-

Two big girls kick a little boy and a little boy  
is cry.

A few examples occur of contrastive conjunction, using but:-

Before I have dog, but my dog has crash by car  
Before the small boy's dad slap his face, but not  
now his dad not slap to him.

All children produce compound NP's, using and:

Yesterday Mary and John looked the television  
The two girls kick knee and bottom boy

It is probable that this fairly primitive device is within the competence of all the children tested, although they may not, on any one occasion, choose to make use of it.

In contrast causal and relative clauses are probably beyond the capability of most of the children. One child used several causal constructions quite spontaneously:-

Father gave Charles present because he's birthday  
Everyday the small boy's dad slap his face because  
he alway naughty boy

In these examples the strategy used is very close to that in normal English: deletion of the second co-referential NP and replacement by a pronoun in the appropriate case. A third example:-

Tomorrow two big girls will kick to him because a  
little boy been rude to two big girls

is handled less skilfully, possibly because of the additional cognitive strain involved in handling two pairs of co-referential NP's. One pair (two big girls) is left untreated, while in the other it is the first that is deleted. This suggests uncertainty in the use of causals. In contrast pronominal substitution is well-based: even here the correct case is used. The emergent nature of the causal transformation is seen also in:-

A little boy can't climb the tree because the  
tree is too high



where there is no deletion of the co-referential NP and the child seems to have fallen back onto the more primitive strategy of conjoining, but with because in place of and.

Another child produced several examples of relativisation:-

Tony and Mary watching the television is cartoon.

A possible deep structure underlying this may be:-

Figure 3

S

Tony and Mary watching television

S

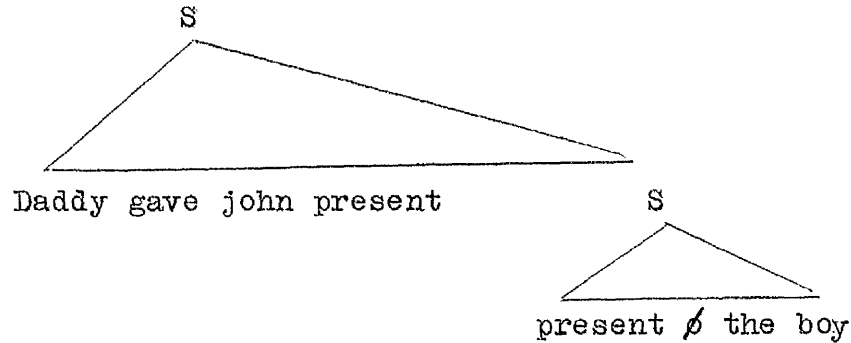
Television is cartoon

Deletion of the co-referential NP in the second sentence but without the knowledge necessary to replace it by a relative which would produce the final sentence.

In this example be is used correctly, but as a whole group the children are very uncertain about be and have (Ivimey, in pre. (a)), often omitting them. It may be that, underlying the sentence Daddy gave John present the boy are

two simpler sentences: Daddy gave John present and Present  
Ø the boy (where Ø = some form of be):-

Figure 4



Deletion of the co-referential present from the second sentence would generate the surface form:-

Daddy gave John present Ø the boy

which would appear in writing or speech in the form quoted above.

These examples suggest that at least two of the children can handle the semantics of complex sentences quite skilfully but do not yet possess the syntactic knowledge necessary to map meanings adequately into utterances.

#### Discussion

The sentences analysed in this paper exhibit all the features reported by earlier workers: preference for short, simple sentences, omission of function as opposed to

content words, over-reliance on nouns and verbs, utilisation of "deafisms" and so on. However, these features are not random and unintegrated, but form a structured system. Although as between children there is considerable variation in surface forms of utterances, the deep structures underlying these utterances appear to be generated by rather similar syntactic devices, both base and transformational. We may state with confidence that the corpus of language described and analysed in this paper is a coherent and ordered system, which, since it deviates markedly from normal English, may be considered a language in its own right. At this stage no claim can be advanced that this is the language of young English deaf children considered as a group, although the general similarity between the present findings and those of earlier workers suggests that the system may be much more widely spread.

The implications of these findings are great and extend beyond the rather restricted world of the education of deaf children. The rules that generate the sentences must be based, at least partly on the experiences of the children. Yet they do not seem to reflect very accurately this experience. None of the current widely accepted models of language acquisition can explain this, but it clearly presents a problem for workers in the field (Ivimey, in pre.(b)).

The findings also pose problems for teachers of deaf children. The pessimistic assertions of Blanton and

Fusfeld quoted in the introduction ~~can~~ be rejected; at least this group of deaf children has acquired some linguistic concepts. The problem is: why they have not acquired the concepts their teachers have tried to teach them (Ivimey, 1976 (b)).

Perhaps the major implication of this analysis is that the language eliciting test used is a viable means of collecting linguistic data, that may be susceptible of application in a much wider field.

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## Appendix

The test was used also with a control group of normally hearing children of similar age, ability and socio-economic background in order to detect whether the form of the test caused any systematic distortions in the language produced. The unusual form of the test initially caused some problems but the children soon accepted the lack of comment on their efforts from teacher-like figures and produced a full range of sentences. The examples below, produced in response to identical stimulus pictures with identical prompts reveal very clearly the differences between the children.

### Control

The girls are kicking the boy.

The boy is tripping over the stone.

The boy is walking to school.

Everyday the boy climbs up the tree.

Tomorrow Joan and Peter are going to watch telly.

The dog had already bitten the postman's leg.

The girls are not kicking the boy.

Yesterday the boy did not pull his hair.

Why did Jean and Peter want to watch the telly?

When will the dog bite the postman's leg?

The big boy is giving the little boy a present.

Deaf child: Stage 1.

The two girls kick the boy. (kick used with other tenses)

The boy fall over the stone.

Yesterday the boy walked the school.

Everyday the boy climbed up the tree. (climbed up also used with other tenses)

Yesterday Mary and John looked the television<sup>x</sup>

Yesterday the dog bite the postman. (bite used with other tenses)

The two girls is not kick the boy.

Before the man is not punch the boy.

What is Mary and John looked the television yesterday?

What is the dog bite the postman tomorrow?

Daddy gave the baby present.

Deaf child: Stage 2.

The girl's is kick the boy.

The boy is fell the stone.

The boy is back and walked to school.

The boy is climbed the tree everyday.

Mary and John is looking the television. (with future reference)

The letter is dog the postman and bite.

The girls is not kick the boy.

Yesterday the boy is not slap.

Why did they look?

Where did dog the letter?

The boy is give present the man.

---

x A future was not elicited in this case. Looked was used with present and past time reference.



APPENDIX C

Unpublished papers

- (2) Ivimey, G. P.: Be and have in the syntax of English deaf children.

A b s t r a c t

In producing written sentences in response to standard pictorial stimuli a group of severely deaf English children were less successful and less confident in handling be and have than more concrete verbs.

A common explanation of this phenomenon is that be and have are both fleeting when seen on the lips and difficult to lipread in themselves. This explanation is rejected in favour of one based on a delay in the acquisition of semantic information relevant to accurate usage of these words.

Such a finding may have important implications in models of acquisition of language.

## Introduction

Several investigators have concluded that children with severe hearing loss dating from or shortly after birth cannot or do not form syntactic rules which can be used spontaneously and creatively to produce new sentences. Thus Fusfeld (1955) characterises the written language of the deaf as "a tangled web type of expression in which words occur in profusion but do not align themselves in an orderly way", while Blanton writes: "Whatever function these (i.e. syntactic skills) serve for people with ordinary hearing, the deaf seem to have difficulty making use of syntactic markers and in turn using them in generating language, i.e. writing" (Blanton et al. 1971). Later in the same work he confesses that "the form any syntactic organization that the deaf may possess is unknown" (ibid. p. 103). In contrast with these views workers at the University of London Institute of Education have shown that young English deaf children do possess organized sets of linguistic rules which they apply systematically and creatively when attempting to generate written sentences. These rules may be coded in a re-write form similar to that used by Chomsky (1957) and can be divided into base and transformational systems. In the latter, especially in the case of the interrogative transformation, it is possible to detect some subsidiary ordering relations (Ivimey, to appear, Ivimey and Lachterman, to appear).

However, the investigation on which these studies were based revealed a large discrepancy between the manner in

which more "concrete" verbs (e.g. jump, slap, walk, fall) on the one hand, and be and have on the other were treated. With the "concrete" verbs the rules for applying time reference, negation and interrogative transformations are consistent and clear. In addition to regularities within a single child's system, one may perceive general regularities between children. In marked contrast to this we find, in the use of the "non-concrete" be and have much less certainty in an individual child and greater variation between children. Ivimey (op. cit.) noted a distinct contrast in the confidence with which children approached the two sets of verbs. They appeared much less happy when trying to use be and have: several exhibited marked signs of discouragement and even of distress and this part of the test had on occasion to be abandoned.

Be and have form a class apart from the other verbs used in this test. These latter have obvious reference and their "meaning" can be demonstrated actively, by pictures or by pointing. Be and have, in contrast, have a dual function: one function is more concrete, the other less. In their more concrete functions be and have indicate attributes or possession, while elsewhere they act largely as carriers of important semantic features: number, tense and aspect. With the possible exception of number these important concepts cannot be demonstrated, they can only be experienced and after

experience, deduced.

If we assume that one major task of an acquirer of language is to construct an appropriate model for linking underlying semantic aspects of language to the surface aspects (whether phonetic or graphic), then we may postulate that surface expression will not occur until at least some of the underlying semantic features have been mastered: a child is not likely to use a form (except as sheer imitation) before he is satisfied that he knows (in some way) what it means. His usage may be wrong, but this does not invalidate the argument. It merely indicates that his knowledge was faulty or his confidence misplaced.

If these assumptions are justified we should expect children to acquire semantic knowledge in roughly the following order:-

1. First learned will be semantic concepts that are relatively easily demonstrable and "concrete".
2. These will be followed by concepts whose referents are more obscure and/or non-concrete.
3. Finally and after some delay those concepts will be learned whose referents are wholly abstract, especially those whose function is largely one of syntactic signalling.

We should expect that this order of concept acquisition would be mirrored by a similar order of appearance in sentence production:-

1. Concrete words (here jump, etc.) will appear earliest and be welded rapidly into the syntactic system that is developing.

2. The more concrete aspects of have and be (possession and predication of attributes) should appear rather later.

3. Purely syntactic use of be and have should occur latest.

#### Method and test population.

The method of eliciting corpora of linguistic data and details of the children tested are fully described by Ivimey (op. cit.) and Lachterman (1974). In brief, the method consists of presenting each child with coloured pictures of some incidents involving vocabulary likely to be known to the child, in order to elicit from him a spontaneous sentence in writing. The reasons for using writing rather than speech are set out elsewhere (Ivimey and Lachterman op. cit., Ivimey, in preparation). Thereafter each child is induced to alter his sentence systematically to show varying time reference, negative and interrogative forms, etc. Later the sentences, whether correct in terms of standard English or not, are examined for consistencies on the fundamental assumption that if a language user spontaneously produces syntactic forms that are regular and consistent with each other then we may infer that he is using a system of syntactic rules to generate them. On the basis of perceived

consistencies an attempt may be made to write a partial transformational grammar that appears to account for most of the sentences produced.

Results: affirmative sentences, (a) Be.

In this group of children we can see three rough stages in the emergence of the use of the copula.

Stage 1 (a). The earliest stage is represented by the subject, CF, of Ivimey's original paper. In nine copular sentences she used only three verbs, they have and I was for the present and I was for the past.

Elsewhere she uses nothing:-

<u>I boy man</u>	<u>You child boy</u>	<u>Before you child boy</u>
------------------	----------------------	-----------------------------

Stage 1 (b). Two children are using actual forms of verb but in an apparently random manner:-

<u>I is man</u>	<u>I (are) the man</u>
<u>I are very happy</u>	<u>You (are) the boy</u>
<u>You are boy</u>	<u>We are the children (JW)</u>
<u>Now he was bad boy</u>	(AJ)

In the case of JW it was difficult to elicit the verb. Her first productions were I the man and you the boy, similar to the productions of CF in Stage 1. Then she produced quite spontaneously We are the children, after which she returned to the earlier forms and corrected them. It is probable that in this case her grammar is transitional between Stages 1 and 2.

Stage 2 (a). At this stage the verb is handled in the present with greater confidence but there is a curious yet consistent omission of the second person form:-

I am happy

I am man

You John

You big boy

We are children

We are children

They are girls (DA)

They are children (LR)

Stage 2 (b) and Stage 3. The remaining four children use all standard forms in the present. Stage 3 separates off from 2 (b) in that it reveals a gradual move towards the development of an internal system of verbal markers, i.e. one in which the verbal element itself changes, as opposed to the more common external system where any changes felt to be needed are indicated by a time marker affixed to the sentence treated as a unit (Ivimey, op. cit.). In Stage 2 (b) be is assimilated to the external system:-

We are very happy cf

He pull the little boy hair

Before we are happy cf

Before he pull his hair

Tomorrow you are happy cf

Tomorrow he pull his hair (LE)

Only two children have reached the slightly more advanced stage 3. AJ, although still in stage 1.(b) as regards his use of presents, does use two correct past tense forms:-

Tom was bad boy

Before he was good boy

with perhaps a hint of the emergence of a future form:-

RW is developing a more correct future form:-

<u>A long time you will be man</u>	<u>They will not be children</u>
	<u>any more</u>

She has reached this stage also in her handling of "concrete" verbs, and her past tense usage for be (Before I am baby) reflects her treatment of other verbs: a time marker affixed externally to a unit sentence containing an unchanged verb.

(b) Have

The dual function of have (as an indicator of possession and as a carrier of syntactic information) has already been discussed. The sentences produced by the deaf children in this investigation reveal a clear concept of possession, and this sometimes reflected in a confusion of verbs actually used. Thus RW wrote: I am hold my doll (for I have ....) and Tomorrow I will buy new dog (for I will have ....). However, in this sample of children the tendency was restricted to this girl. It seems to occur more often among older deaf children (Ivimey, in preparation).

We can detect rather similar stages in the development of the use of have as were shown in the use of be.

Stage 1.

The most primitive stage is exemplified in the sentences of LR who substituted be for have:



I am ball

You before is dog

You are dog

Tomorrow I am ball  
(for the past)

JW is in much the same position but introduces incorrectly some forms of have:

I are the ball

Yesterday I are the ball

You are have the dog

Tomorrow they are ice-cream

I have are the dog (for past, after much prompting)

This confusion is rather difficult to explain, but it may reflect a very early stage in the semantic differentiation of the two verbs. Be is used to link the subject and an attribute, have to link a subject and thing possessed. It may be that an early stage possession is also seen as an attribute. The language acquirer is thus faced with a rather difficult problem: first he must distinguish an attribute indicator from a more concrete movement indicator (the difference between be and the "concrete" verbs). But then he must also distinguish between two different sorts of attribution. All this must be carried on against a background of other occurrences of be and have, used as syntactic-semantic carriers, which are meaningless to him at this stage but which must surely form some sort of cognitive clutter confusing the issue.

Stage 2.

Have is distinguished as an indicator of possession and, in the present, used more or less correctly:-

You have dog (RW)

I have a ball (SW)

but, as with be at the equivalent stage, it functions as a largely unchanged unit verb, with time reference being achieved by the affixing of an appropriate external marker:

Before I have dog (RW)

Tomorrow they have some money (AJ)

In all, four of the nine children studied are in this stage.

### Stage 3.

The emergence of slightly more advanced forms is seen in the case of three children. Although the sentences of LE and SJ are mainly in Stage 2, they both attempt to use more advanced forms:-

Before you had lovely a dog

I will bring at dog food (LE)

This latter may be additional evidence of the confusion of have as possessor with other more concrete verbs. LE also produces the correct (but for her deviant) sentence I have broken my doll, the only sign among the children of the existence of have used as a syntactic-semantic carrier. SJ appears to be attempting to use more advanced forms but less successfully:-

Tomorrow you going to have a dog

Tomorrow they are going to (omitted - have?) two icecream

The forms used by these two children are probably transitional to the third stage. In contrast DA is attempting to use a much more complex system of internal markers:-

You been have a dog

They will have their icecream

I will have a ball

Negation.

In their handling of concrete verbs this group of deaf children use a rather simple negative transformation:-

$T_{neg} : X + \text{unit verb} + Y \quad X + \text{neg} - \text{unit verb} + Y$

where neg = not, did not, etc. (Ivimey and Lachterman, op. cit.) Did not appears to be used as a negating unit, not as past-do + not, since the child who uses it with concrete words, also uses it with be and have:-

They are did not three girls

I have did not a ball (SJ)

Since the handling of these verbs in the affirmative appears to be emerging slowly and different children are in different stages of development, one would expect the use of negation with the verbs also to differ as between children. By and large the stage reached in handling affirmatives is also reflected in the use of be and have.

Have: Stage 1.

The most primitive stage would probably be one in which the verb is not expressed at all. None of the children tested is in this stage, because they are using be rather than have:

I are not the ball

(JW)

I am before not ball

(LR)

Stage 2.

Most of the children are found to be at this stage in which not or n't is postfixed to have which functions as an externally modified form:-

I have not ball (AJ, SW)

Tomorrow they have no some money (AJ)

I have did not a ball (SJ) /

I haven't got ball (JW)

DA appears to be in a transitional stage. We have already seen him, in the affirmative, trying to use more advanced forms, but these are still not even approximations to standard English. Instead the internally modified forms are treated as units to which the negative is postfixed:-

I been have not a ball

They will have not icecream

Stage 3.

Only one child has reached this stage. LE writes:-

Before you had lovely a dog I had not play with my ball

I have a ball

I have no ball

RW may be approximating to this stage, but apparently by not using have at all:-

They will not buy some icecream (for will not have).

Be.

In contrast to the "in-step" development of the affirmative and negative with have, the handling of negation

with be is much less certain.

### Stage 1.

Three children are still in the stage of omitting the verb entirely or mostly:-

I not baby (AJ)    We not children (DA)    I not baby (CF)

This finding is particularly interesting, since in the affirmative only one child was in this stage: AJ was in Stage 2 and DA was in transition between Stages 2 and 3. However, with the additional cognitive load of negation to handle these two children regress to the more primitive form. This was noticeable also in the handling of concrete verbs (Ivimey and Lachterman, op. cit.).

### Stage 2.

Five children were in this stage: the use of a more or less correct present form of the verb, treated as a unit in sentences to which are affixed an external time marker:-

We are not the baby      In many years they are not children (JW)  
We are not trouble (LE)

Once again SJ produces his idiosyncratic negatives:-

I am did not mummy      We did not Daddy  
They are did not three girls

### Stage 3.

Only one child produced any sentences that could be classified as in advance of Stage 2, i.e. one in which there

is some development towards an internal system maintained under the added cognitive load of negation:-

They will not be children any more (RW)

#### Interrogatives.

It was impossible to obtain any interrogatives in this part of the test. This is not surprising when it is realised that these children are, for the most part, far from confident in handling affirmatives. When applying the negative transformation most seem just able to cope with the cognitive load, although, as we have seen, some regress to a more primitive stage. In the application of the interrogative transformation to "concrete" verbs there are some rather subtle ordering of rules which must impose an extra cognitive burden on the children. These, together with negation superimposed on what seems to be a very unstable base are apparently too difficult for these children to handle.

#### Discussion.

In the Introduction it was argued that, since their referents are less clear than those of more concrete verbs, and because be and have have multiple functions, as indicators of attribution and possession on the one hand and as carriers of important syntactic-semantic information on the other, the development of these verbs in the syntax of the deaf is likely to be delayed. This delay does appear to occur:-

Table 1.

Developmental stages of be, have and concrete verbs.

Stage	<u>be</u>	<u>have</u>	<u>concrete verbs</u>
I. (a) Primitive:			
little or no use	CF		
(b) Form emerges,			
confused	AJ JW	LR JW	
II.(a) Correct in present, with omission.	DA LR		JW ?
(b) Prst.correct;			
vb. and sentence	LE SW SJ RW SW AJ LE CF AJ LR		
act as units		CR	SJ
III. Emergence of			
internal markers	RW	LE SJ DA RW SW DA	

In Table 1 we can see a "bunching" of children at a more advanced level of concrete verbs with "tails" spreading towards more primitive usages in the cases of have and be.

The differences can be more clearly seen if the stages reached in each category by individual children are examined:-

Table 2.

Relative positions of stages reached.

Group I	DA	be	<	have	=	c.vbs.
	CF	be	<	have	=	c.vbs.
	AJ	be	<	have	=	c.vbs.
	SW	be	=	have	<	c.vbs.
	JW	be	=	have	<	c.vbs(?)
Group II	LR	have	<	be	<	c.vbs.
	RW	have	<	be	=	c.vbs.
Group III	LE	be	=	c.vbs.	<	have
	SJ	be	=	c.vbs.	<	have

There are rather smaller differences than might have been expected between have and the concrete verbs for five children, and between be and the concrete verbs for two others, but there is a clear difference between these two verbs and concrete verbs for the majority of children. In only two cases are concrete verbs handled less well than have, and here too be lags behind in its development.

The evidence in this paper shows fairly conclusively that the deaf children studied find greater difficulty in handling be than concrete verbs like jump, slap and walk. Many experienced workers with deaf children would attribute this difference to the difficulties and uncertainties of interpreting speech through lipreading: is, are and am are,



it is held, fleeting and undistinguished by clear lip movements. Therefore the children cannot acquire knowledge of them and as a result cannot be expected to use them. Now this is undoubtedly true, but unlikely to be the only or even the major factor operating. Such a view is based on a number of considerations:-

1. Half of the children tested used a form of "assisted oralism" (Cued speech) in the classroom. This has been designed to reduce some of the ambiguities involved in lip-reading. As it is currently used, words like are, am and is are accompanied by distinctive hand movements, but the children who have been exposed to this less ambiguous method of communication do not appear to be noticeably better in their handling of these words than those who rely mainly on lipreading alone.
2. All of the children have been exposed to considerable amounts of written and printed material in their schooling. In this form the words under discussion are neither impermanent nor less clear than any others.
3. Forms like will be, have been and were do present clearer patterns on the lips but they have not developed at all. If it were merely a question of visibility one would expect these more visible forms to appear at a rather earlier stage.
4. The problem appears to be more one of conceptual lack, and since there is little evidence that deaf children are ipso facto intellectually retarded, this rather restricted form of retardation needs explanation. A large body of evidence (summarised e.g. in Neisser, 1967) suggests that

humans perceive largely in terms of expectancies, assumptions and models that have been constructed by the observer in terms of his past experience and attempts to go beyond the information given (Bruner, 1974). What is unexpected or incongruent with existing models is very often mis-perceived or may remain entirely unnoticed. It may be that similar processes are operating in the perception of language. Ivimey and Lachterman (op. cit.) have shown that these deaf children do not use the normal system of internal markers (Ivimey, to appear (a)) represented by have been, will be, etc. It is possible that even if the children were able to see these forms clearly, as in reading for example, they would tend to be filtered out of the perceived message as "noise" and thus there would be delay in their acquisition.

It is plausible therefore to argue that the delay in acquiring these forms reflects delay in acquisition of underlying semantic knowledge rather than in difficulties in interpreting speech through lipreading, although this clearly contributes. A more serious contribution is probably made by the rather restricted exposure to normal language that current practices of teachers of the deaf allow. It has been shown elsewhere (Ivimey, 1975) that the process of acquiring English morpho-phonemic rules mirrors that of acquiring other concepts. When exemplars are stable and occur frequently then acquisition of the underlying rule is rapid. Where exemplars are unstable and occur infrequently

then rule acquisition is very slow.

The evidence explored in this paper suggests that much the same applies to the acquisition of semantic concepts: where reference is clear, acquisition is rapid, where it is unclear and confused acquisition is delayed. Time and aspect are certainly not represented in experience by clearly visible referents. The growth of relevant concepts involves, of necessity, the passage of time and much experience. Until time has passed and experience has been gained the concepts cannot develop and until they have begun to develop the child cannot use and probably does not clearly perceive the audible or visual exponents.

Valuable ancillary evidence is provided by the way these children use prepositions: they use concrete, locative prepositions confidently, but omit most of those whose function is mainly syntactic (Ivimey, to appear). It may be noted too that these children tend to omit the "dummy do" in negatives and interrogatives. Since the semantic features of "dummy do" are highly abstract their detection, crystallisation and understanding involves lengthy time spans. Very few examples of "dummy do" can be found in the protocols of any of the children in this sample.

The early confusion between be and have noted in several children in the sample may be particularly instructive, representing a transition stage between non-use (i.e. non-understanding) and use (i.e. understanding). At this

stage the children appear to have formed a rather misty concept of be and have as indicators of a primitive relationship between two parts of a sentence:-

<u>I am a man</u>	→	<u>I ∅ man</u>
<u>I have a dog dog</u>	→	<u>I ∅ dog</u>

but without distinguishing between different aspects of the relationship, viz. attribute and possession.

The conclusions reached in this paper may have importance far beyond the problem of acquisition of language by a small group of deaf children. If they are valid then much research into the acquisition of linguistic competence has been misdirected: it may be not so much syntactic knowledge as semantic information that children must acquire. This may underlie the so-called telegraphic speech that many researchers have reported in early childhood. The delay in acquiring function words as opposed to content words may be due less to their unstressed character as McNeill (1970) among others asserts, but to the difficulties that little children with limited experience inevitably have in constructing for themselves an appropriate semantic model that incorporates abstract elements without clear referents.

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